

**INTEGRATED LOGISTICS SUPPORT PLAN (ILSP)**  
**FOR THE**  
**ENHANCED TERMINAL VOICE SWITCH (ETVS)**  
**CIP C-05**



**Federal Aviation Administration**

**Plan Number 94-700-001**  
**Revision 003**

**December 16, 1999**

## **APPROVAL PAGE**

This revision of the Integrated Logistics Support Plan (ILSP) for the Enhanced Terminal Voice Switch (ETVS) has been updated to all changes to reflect the current program status.

This ILSP presents the procedures necessary to accomplish the National Airspace Integrated Logistics Support (NAILS) requirements for the ETVS.

The Associate Product Lead for Logistics (APLL) is the point of contact for all NAILS related matters of this project.

Approval of this document constitutes the baseline for the ILSP. Any additional changes will require coordination with the NAILSMT members.

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ETVS ILSP  
Dated 12/15/99  
Revision 003  
Change 1, 1/5/2000

ETVS Integrated Logistics Support Plan (ILSP), Revision 003, dated 12/15/2000 has been amended.

Technical information in the ETVS ILSP, Chapter 5, paragraph 5.2, Special Tools and Test Equipment, equipment list has been revised since publication was distributed. Change page is marked "Change 1, 1/5/2000".

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## **1.0 INTRODUCTION**

The Integrated Logistics Support Plan (ILSP) for the Enhanced Terminal Voice Switch (ETVS) product provides guidance for execution of Integrated Logistics Support (ILS) elements for support of the ETVS product. The ILSP is an iterative document and will be updated as required.

### **1.1 SCOPE**

This document describes the ILS elements planned for the ETVS product. It includes the overall management and user responsibilities, maintenance requirements, supply support, and training requirements for the ETVS product.

### **1.2 REFERENCES**

This ILSP was prepared in accordance with Federal Aviation Administration (FAA) policies and standards. A listing of documents referenced is provided at Appendix A.

### **1.3 ELEMENTS OF LOGISTICS SUPPORT**

ILS is an interrelated, unified, and iterative approach to the managerial and technical activities that support the National Airspace System (NAS). The analysis associated with ILS is intended to influence the system design and to minimize life-cycle costs. Through the implementation of ILS requirements, support requirements are identified and included in the ILSP.

FAA Order 1800.58A, National Airspace Integrated Logistics Support (ILS) Policy lists the eight logistics support elements that are required to accomplish the ILS tasks. They are:

- 1) Maintenance Planning;
- 2) Supply Support,
- 3) Support Equipment,
- 4) Training, Training Support, and Personnel Skills,
- 5) Direct Work Staffing,
- 6) Maintenance Support Facilities,
- 7) Packaging, Handling, Storage, and Transportation (PHS&T), and,
- 8) Technical Data

Each logistics support element is discussed in detail in subsequent sections of the ILSP.

Maintenance support requirements formerly identified in a Maintenance Requirements Document (MRD) have been incorporated into this ILSP. Maintenance requirements have been coordinated between ARN-200 (Communications and Navigation Division), AML-6000 (Communications Product Division), FAA Logistics Center (FAALC), and AOS-510 (Communications Engineering Support Branch).

## 1.4 SYSTEM DESCRIPTION

The ETVS product will provide air-to-ground (A/G) and ground-to-ground (G/G) and voice communication and switching functions for airport traffic control towers (ATCTs) and terminal radar approach control (TRACON) facilities.

### 1.4.1 ETVS Product

The ETVS will replace obsolete electro-mechanical switching units and will provide improved voice switches for new and modernized ATCTs and TRACONs. The ETVS switches will vary in size according to the number of operating positions, i.e., five (5) to 80 operating positions. The ETVS will provide a variety of capabilities not available in currently installed terminal voice switching equipment. Examples of these new capabilities include: digital G/G interfaces, automatic terminal information service (ATIS) support, management information system (MIS), communications traffic data (CTD) and system event collection, remote maintenance monitoring subsystem (RMMS) and maintenance data terminal (MDT) interface, and voice switching and control system (VSCS) to voice switch interface. These added capabilities will improve air traffic (AT) and airway facilities (AF) work force efficiency, reduce the need for site maintenance personnel, and enable the Government to keep pace with current and future telecommunications technology. If these new capabilities are not available when the ETVS is fielded, they will be added as preplanned product improvements (P<sup>3</sup>Is).

The ETVS contract was awarded to Litton Denro, Incorporated, Gaithersburg, MD, on July 26, 1995. The 10-year contract consists of a base period (3 years), two two-year and three one-year options. ETVS systems can be procured during the base and the two two-year option periods; support services can be procured for the full 10-year, 6.5 months (per contract Mod 0016) life of the contract.

The ETVS is a joint FAA and Department of Defense (DOD) procurement. There are a total of 412 systems available in the contract to be ordered: FAA –154 / DOD 258. The FAA has been designated the lead procurement agency and will provide logistics support and services to DOD sites. The FAA will provide support to DOD ETVS as described in the FAA-DOD ETVS Memorandum of Agreement (MOA) for Logistics Support.

The FAALC is responsible for ensuring logistics support is available until the ETVS is replaced. It is anticipated that the ETVS will have a service life of at least 15 years.

## 1.5 ETVS INTERFACE CAPABILITY REQUIREMENTS

ETVS equipment will have the following external interface requirements and capabilities:

- 1) A/G communications;
- 2) G/G interphone communications;
- 3) Legal recorder;
- 4) Operational Support Telephone System (OSTS);
- 5) Remote Maintenance Monitoring System (RMMS); and,
- 6) Voice Switching and Control System (VSCS) to Voice Switch Interface.

## 1.6 ETVS MILESTONES

Some of the key ETVS product and logistics milestones are shown in Table 1.6-1.

TABLE 1.6-1 ETVS MILESTONES

EVENT	DATE
National Airspace Integrated Logistics Support Management Team (NAILSMT) Meetings	January (94); January (96), March (97, <u>August (99)</u> )
Integrated Logistics Support Plan (ILSP)	July 1994(F); February 1997 (Rev 001), August 1998 (Rev 002), October 1999 (Rev.003)
Contract Award - DTFA01-95-C-00027	July 26, 1995
Logistics & Training Guidance Conferences	September 1995
Provisioning Guidance Conference	November 1995
First Article Testing (FAT)	October 1996 – March 1997
Air Traffic (AT) Training - Traditional Classroom Course Completed - Computer Based Instruction (CBI Course) Completed	July 1997 June 1998
FAATC Operational Test & Evaluation (OT&E)	May-July 1997; November 1997
Airway Facilities (AF) Training - Available At Litton Denro - FAA Academy (FAAAC) Training System Installed - AMA-410 Classes Begin at FAAAC	April 1997 May 1997 September 1997
Santa Barbara, CA - OT&E/Shakedown - Initial Operational Capability (IOC)	April-May 1998 June 10, 1998
Colorado Springs, CO - Independent Operational Test & Evaluation (IOT&E) - IOC	May/August 1998 May 17, 1998
Physical Configuration Audit (PCA)	June 1998
Second Level Support (AOS-510) System Installed	July 1998
Provisioning Conference	August 25-27, 1998
In Service Deployment (ISD) Decision	June 8, 1999
FAALC Responsible for ETVS E&R Support	January 1999
Last System Delivery	February 2006

## **2.0 LOGISTICS MANAGEMENT**

This section describes the organizational structure and responsibilities between the Government and Litton Denro for planning and implementing logistics support for the ETVS.

### **2.1 NATIONAL AIRSPACE INTEGRATED LOGISTICS SUPPORT MANAGEMENT TEAM (NAILSMT)**

The Associate Product Lead (APL) for Logistics, ARN-200, Voice Switching and Recording Product Line is responsible for establishing a NAILSMT to support the ETVS. The NAILSMT will provide guidance, coordination, and support for all logistics requirements for the ETVS life cycle. The NAILSMT membership and organizations that support the ETVS program are listed in Table 2.1-1. The APL for Logistics functions as the chairperson for the NAILSMT.

The APL for Logistics will schedule NAILSMT meetings, as needed. Normally, the NAILSMT will meet at least annually. Guidance on responsibilities of the NAILSMT is contained in FAA Order 1800.58A.

### **2.2 GOVERNMENT ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES**

The Government's organizational structure and a summary of responsibilities of each in support of the ETVS product are described below.

ARN-200 - The Communications and Navigation Division manages the life-cycle support program for NAS communications systems. ARN-200 coordinates the disposal of displaced systems and equipment for Airway Facilities (AF), supports the ILS process, oversees the configuration management processes, and monitors depot level spares and repair parts. ARN-200 appoints the Associate Product Lead (APL) for Logistics and a support team to direct and manage the logistics requirements of the product.

ARN-200/APL Logistics - The APL Logistics (APLL) reviews all ILS requirements and assists the Integrated Product Team (IPT) Lead, AND-320, and coordinates with the IPT and NAILSMT personnel to ensure the timely acquisition, development, and accomplishment of logistics and training requirements.

ARN-200/Requirements - The Technical Requirements Specialist identifies maintenance requirements, develops disposal plans for existing and planned communications products, and advises the IPT Lead and APLL on AF requirements.

ARN-200/NISC - The logistics and training analysts from the NAS Integration Support Contractor (NISC) supports the APLL and assist in the development, coordination, and implementation of logistics and training plans and schedules.

TABLE 2.1-1 NAILSMT MEMBERSHIP

<b>POSITION</b>	<b>ORGANIZATION REPRESENTED</b>
Chairperson, APL Logistics	Communications and Navigation Division, ARN-200
Co-chairperson, IPT Lead	Integrated Product Team (IPT), Voice Switching and Recording Product Line, AND-320
Member	Contracting Officer's Technical Representative/Product Lead (COTR/PL), AND-320
Member	Airway Facilities Requirements, ARN-200
Member	Work Force Planning and Development, AFZ-200
Member	Airway Facilities Training, AFZ-100
Member	Air Traffic Requirements, ARN-200
Member	Air Traffic Training, ATX-100
Member	Second Level Engineering Support, AOS-510
Member	FAA Logistics Center, AML-6000
Member	FAA Academy AF Training, AMA-410
Member	FAA Academy AT Training, AMA-551
Member	APL for NAS Implementation, ANS-700
Member	Hardware Contract Maintenance Team, AOS-7
Member	Regional Representatives, AXX-400/500
Member	Professional Airway System Specialist (PASS) Representative, AFZLA/AWP-455.43
Member	Joint Program Coordinating Office (JPCO), AND-6
Associate Members	ILS Contractor Support (NISC)

AND-320/IPT Lead - The Integrated Product Team (IPT) Lead for Voice Switching and Recording Product Line, provides management direction for the ETVS product. The IPT Lead oversees the acquisition, design, development, testing, and commissioning of the product. The IPT Lead is

responsible for the budget, contract, and all activities required to acquire and support the product through deployment.

AND-320/COTR - The ETVS contracting officer's technical representative/product lead (COTR/PL) ensures all engineering, testing, logistics, and training requirements are identified in and accomplished in accordance with the ETVS contract. The COTR/PL advises the IPT Lead on all ETVS contract requirements. The COTR/PL has assumed the responsibility for the Configuration Management (CM) of the ETVS until the CM function is transferred to AOS-510, e.g., after the ETVS is baselined. In accordance with NAS policy, the ETVS will be under CM throughout its life cycle.

AFZ-200 - The Work Force Planning and Development Division provides an analysis of the direct works staffing requirements and issues. The maintenance staffing levels for the ETVS are shown in Section 7 of this ILSP.

AFZ-100 - The Airway Facilities (AF) Training Division ensures maintenance training requirements are satisfied for the ETVS life-cycle.

ANS-700 - The APL for NAS Implementation (APLNI) provides support to AND-320 for implementation of the ETVS program. The APLNI manages the development of the Product Implementation Plan (PIP), the Generic Site Implementation Plan (GSIP), and as required, assists the regions in the development of a Site Implementation Plan (SIP). The APLNI also coordinates with AND-320 to conduct field implementation team meetings to foster early identification of problems or issues that impact implementation.

ATX-100 - The Air Traffic (AT) Training Division ensures that air traffic operation and system training requirements are satisfied for the ETVS life-cycle.

AOS-510 - The Communications Engineering Support Branch, AOS-510, provides direct hardware and software engineering support to regional field offices and field facilities. This includes the preparation and maintenance of maintenance orders, maintenance technical handbooks, technical instruction books, electronic/plant equipment modifications (EEMs/PEMs) and the development/implementation of engineering changes to the system CM baseline throughout the ETVS life-cycle.

AMA-1 (FAA Academy) - AMA-410/551 assist in the development, conduct, and administration of national technical (AF/AT) training as established by AFZ-100 and ATX-100 for FAA and other Government and Non-Government personnel. Technical and educational support is provided by AMA-410/551 through the evaluation of contractor-developed training and the implementation of a quality-training program.

AML-[6000](#) - The Manager, Communications Product Division, AML-[6000](#), is the FAA Logistics Center (FAALC) Lead representative on the NAILSMT. AML-[6000](#) coordinates depot-level maintenance planning, supply support, staffing, support and test equipment, maintenance support facilities, and training requirements needed to support the ETVS product. AML-[6000](#) provides AND-

320 facilities and engineering (F&E) budget estimates for initial depot (wholesale) spares, contractor depot maintenance support, and depot support and test equipment. AML-6000 identifies the Logistic Support Analysis/Logistics Support Analysis Record (LSA/LSAR) data requirements, and provides consolidated FAALC inputs to ILSPs, statements of work (SOW), contract data requirements lists (CDRLs), and contract line items numbers (CLINs).

AXX-400/500 - AF/AT individuals from the regions provide points of contact for the identification and implementation of logistics and training requirements, and life cycle support of the ETVS product. Regional AF/AT personnel participate in the NAILSMT on an as required basis.

Professional Airway System Specialist (PASS) Union - A PASS union representative monitors the logistics development for the ETVS and ensures that union support requirements are being addressed. As the first Region scheduled to receive an operational ETVS, the Western Pacific Region provides the PASS representative.

JPCO/AND-6 - The Joint Program Coordinating Office (JPCO) was established at the direction of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (ASD C<sup>3</sup>I) and the DOD Policy Board for Federal Aviation (PBFA). The JPCO coordinates the integration of those portions of the FAA Capital Investment Plan (CIP) that affect DOD fixed-based Air Traffic Control and Landing Systems (ATCALS). The JPCO directly supports the NAS Joint Program Office (JPO) located at Hanscom Air Force Base (AFB), the NAS Senior Advisory Group (SAG) and the Executive Director of the PBFA. The JPCO serves as the principle interface to the FAA for all DOD acquisition issues, acts as the daily liaison for acquisition and logistics issues and support concepts for all Joint DOD/FAA programs.

## **2.3 LITTON DENRO, INC ORGANIZATIONAL STRUCTURE**

Litton Denro, Inc has designated a Logistics and Training (L&T) Manager for the ETVS product and identified the individuals responsible for the LSA/LSAR and the AT/AF training development required by the ETVS contract. The L&T manager functions as the Litton Denro focal point for all logistics and training related requirements. (See also Litton Denro Points of Contact (POCs), Appendix D, Page D-4).

## **2.4 LOGISTICS SUPPORT ANALYSIS (LSA)**

The objective of LSA is to provide a vehicle for decision making in the various logistics disciplines and to provide a database that can be accessed by all functional support elements.

The LSA consists of a series of tasks that provide logistics information on a new system. The LSA tasks analyze the mission, environment, existing support system, and end-item design. The resulting information is used to establish logistics support for the system.

The Contractor as specified in the contract in the following increments will deliver the LSAR:

- a. Increment “A” containing the data required to produce the long lead-time, repairable items, tools and test equipment, and support equipment lists.
- b. Increment “B” containing the LSAR to produce the short form provisioning parts lists (parts peculiar list).
- c. Increment “C”, containing updated Increments “A” and “B” and the data required to produce the common and bulk items, provisioning parts, and interim support items lists for the provisioning conference.
- d. Increment “D”, incorporating all of the changes identified during the provisioning conference(s) and design change notice (DCN) information.
- e. Increment “E”, containing all of the information previously delivered plus all subsequent updates and DCN data and updates, after the last system is delivered to the Government.

#### 2.4.1 LSA Litton Denro Responsibilities

Litton Denro has established an LSA program in accordance with procedures outlined in MIL-STD-1388-1A, Notice 4, and MIL-STD-1388-2B, Notice 1, as tailored by the FAALC via the Logistics Support Analysis Record (LSAR) Data Requirements Form (DD Form 1949-3).

Litton Denro has also established internal procedures for progressive verification of the adequacy and technical accuracy of the LSAR documentation.

#### 2.4.2 LSA Tasks and Subtasks

Litton Denro will perform the following tasks as defined in MIL-STD-1388-1A. The resulting output from the LSA subtasks will be used for the development of applicable LSA Record (LSAR) data files for life cycle support of the ETVS system. The tasks are listed in Table 2.4.2-1. Litton Denro will use previously developed documentation to the maximum extent possible to meet LSA program task requirements.

TABLE 2.4.2-1 LSA TASKS and SUBTASKS

Task	Title	Subtasks
103	Program and Design Reviews	103.2.5
303	Evaluation of Alternatives and Trade-off Analysis	303.2.1 303.2.7
401	<b>Task Analysis</b>	401.2.1 401.2.2 401.2.8 401.2.11 401.2.12

403	Post Production Support Analysis	See Note *
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Note \*: The Post Production Support Analysis results will be included in the Depot Maintenance Transition Plan (DMTP). The DMTP is an option in the ETVS contract that will be exercised if Litton Denro terminates support for the ETVS. (See paragraph 10.3)

### 2.4.3 LSA Data Requirements

In accordance with the contract, Litton Denro has prepared and delivered LSAR data using an LSAR automated data processing (ADP) system. The system as a minimum, the capabilities described in paragraph 4.2.2.2 of MIL-STD-1388-2B and the LSAR Data Requirements identified in the DD Form 1949-3 (Appendix 2, to Section C of the ETVS contract). A master file provided on magnetic media and which includes the parts peculiar items. Litton Denro is required to minimize the use of parts peculiar items. The FAALC has approved the master file, copies were distributed to the DOD.

### 2.4.4 Logistics Support Analysis Control Number (LCN)

The use of an LCN structure provides a logical method for a top-down breakdown of the ETVS hardware. Each equipment item will be assigned a unique LCN for each application of the item that identifies the item's relationship to the next higher assembly. The first three characters of the LCN for the ETVS identify the "A" (or principal equipment) indenture level. The LCN assigned to each item will agree with the equipment breakdown as shown in the applicable ETVS engineering drawings. Litton Denro is responsible for integrating their sub-contractor/vendor items into the overall coding scheme. Litton Denro's proposed numbering scheme is described in their Integrated Support Plan, Contract Data Requirements List (CDRL F01), which was approved by the Government. The basic LCN identifier code applicable to ETVS is: **FPF**.

## **3.0 MAINTENANCE CONCEPT**

The maintenance concept for the ETVS is described below.

### **3.1 ETVS MAINTENANCE CONCEPT**

The maintenance concept for the ETVS product's operational life cycle is in accordance with FAA Order 6000.30B, Policy for Maintenance of the NAS Through the Year 2000, which details a two-level maintenance philosophy; site/field and depot. This concept assumes the use of modular designed equipment, which enables site/field communications specialist/technicians to correct equipment failures by replacing the faulty line replaceable unit (LRU). LRUs will not be repaired on site. Site/field level maintenance consists of all maintenance activities performed on equipment installed in its operating environment and includes both preventive and corrective maintenance actions and the installation of authorized electronic equipment modifications (EEMs). Depot-level maintenance consists of the repair of the failed LRUs, which were returned by the site to the FAALC or contractor facility as appropriate.

The predicted service life of the ETVS system is at least 15 years. Any technology enhancements applied to the ETVS may increase the expected service life of the system. Maintenance and logistics support will be modified to accommodate any changes to the ETVS service life.

### **3.2 MAINTENANCE RESPONSIBILITIES**

The following sub-sections describe the maintenance responsibilities for each level of maintenance.

#### **3.2.1 Site/Field Maintenance**

The Government will be responsible for site/field maintenance beginning at site acceptance.

#### **3.2.2 Depot Maintenance**

After the expiration of a site's 12-month reliability assurance (RA), see Section 3.2.4 below, Litton Denro will provide depot repair/contractor repair services (CRS) for all hardware procured under the ETVS contract for the ETVS life cycle. Sites will be assessed a monthly recurring charge (MRC) for the CRS. FAALC will manage the CRS program and FAALC will budget (Operations Funds) for each FAA site's MRC cost. DOD, i.e., the military services, is responsible for budgeting for the MRC costs for each DOD site.

Under the terms of the ETVS contract, Litton Denro will furnish all qualified labor, supervision, materials, equipment, tools, and services required for the repair of ETVS LRUs. The work will include:

- a. Emergency LRU replacement, i.e., Litton Denro is required to ship a serviceable LRU(s) so that it is received at the designated site within 24 hours, including weekends and holidays, after receipt of a telephonic request from the FAALC official designated in writing by the Government's Contracting Officer.

- b. Routine repair, which requires Litton Denro to complete the repair of LRUs within thirty (30), calendar days after receipt of the unserviceable LRUs.

Litton Denro is also responsible for providing the Government a Failure Summary and Analysis Report, CDRL E05. The report will provide data on all LRUs returned by the Government for repair, both during and after the RA period and will include the items repaired under the CRS provisions (CLIN 0011) of the ETVS contract. The report will include a:

- a. List of all hardware, software and firmware problems received from the Government during the reporting period;
- b. Discussion of all unresolved problems remaining from past reporting periods;
- c. Listing of previously reported problems that were resolved during the reporting period;
- d. Discussion of the action(s) taken by the Contractor to resolve each problem;
- e. Discussion of the action(s) taken by the Contractor to eliminate recurrence of the problem; and,
- f. Any suggestions for maintenance procedure changes which should be taken by the Government to allow the resolution of similar problems at the site level of maintenance.

### **3.2.3 Second Level Engineering Support**

AOS-510 is responsible for providing second level engineering support and technical assistance for the ETVS beginning with FAA acceptance of the first initial operational capability (IOC) site. Once a site becomes operational, assistance can be obtained from AOS-510 by calling one of the following numbers:

- a. (405) 954-0066 (0800-1630 Central Standard Time (CST))
- b. (405) 954-3583 (1630-0800 CST, and weekends/holidays)

The AOS-510 2<sup>nd</sup> level engineering ETVS support system was installed (July 1998) in the AOS facility located at the Mike Monroney Aeronautical Center, in Oklahoma City, OK.

### **3.2.4 Reliability Assurance**

Litton Denro provides each ETVS system with a 12-month Reliability Assurance (RA) coverage that includes the repair or replacement of failed LRU(s). The RA coverage begins at site acceptance (e.g., signing of the Material Inspection and Receiving Report DD-250 Form) of the system. During the RA, Litton Denro is responsible for providing, repairing or replacing the failed LRUs, and the transportation costs associated with shipping the LRUs to and from Litton Denro. Litton Denro also delivers reusable shipping containers, address labels, copies of the Litton Denro Customer Failure Report Forms, and a copy of the ETVS Reliability Assurance Procedure for replacing a failed item/LRU.

**a. ETVS Reliability Assurance Procedures for Replacing a Failed Item/LRU**

See Appendix H, attached

**3.2.5 Headsets, Handsets, and Footswitches**

New peripheral equipment (i.e., headsets and handsets) will not be routinely issued with each ETVS system. Each site is required to identify in the ETVS site survey worksheets the name, part number, quantity of peripherals on hand, and quantity required. ARN-200/AT will validate all requirements for peripheral equipment. After the requirement is validated, ARN-200/APLL will request the FAALC to ship the items directly to the site. Delivery of the peripherals will coincide as closely as possible with delivery of the ETVS. AND-320 will provide FAALC with the funds needed to procure the peripheral items.

- a. FAALC will order/stock headsets and handsets for the ETVS.
- b. Since the FAALC does not stock footswitches with the required 10-foot cable, the footswitches will be ordered through the ETVS contract.
- c. Replacement of unserviceable, headsets and handsets for the ETVS system will be through the FAA Logistics Center. A memorandum to this effect, dated June 29, 1998 has been distributed to all concerned personnel and is included as Appendix I.
- d. Replacement of unserviceable, footswitches will be through Litton Denro and is the same as returning a faulty LRU.

Any questions related to the issue/replacement of ETVS headset equipment should be directed to the FAALC Customer Care Center at 1-888-322-9824 or (405) 954-3793.

FAALC will not provide headset equipment support (supply or maintenance) to DOD ETVS sites. DOD is responsible for acquiring needed peripherals either directly from Litton Denro via the ETVS contract, the DOD supply systems, General Services Administration (GSA) schedule, or Original Equipment Manufacturer (OEM).

**3.2.6 Touch Entry Device (TED)**

The ETVS operator position equipment provides the operator interface for channel selection and switching using Touch Entry Displays (TEDs) and/or hardkey controls. The TED is an interface device with a resistive touch-sensitive membrane screen mounted on a liquid crystal display (LCD) panel. TED and membrane hardkey positions enable the operator to initiate and respond to all radio, telephone, and intercom communications configured at the position.

Note: **Care and cleaning of TED displays:** use a general purpose glass cleaner with a soft cloth/towel. The front of the display is acrylic over the polarizer and compensation film. The acrylic is not a problem, but the polarizer and compensation films do not like water based anything.



## **4.0 SUPPLY SUPPORT**

This section describes the methodologies and procedures used in acquiring and maintaining spares and repair parts supply support necessary to accomplish ETVS maintenance. The FAA supply system will support two principal elements: (1) the site/field and (2) the depot. The following describes the two elements and the procedures used to maintain a supply stock level for maintenance components to support the ETVS equipment.

- 1) Site/Field stock includes spare LRUs, parts delivered with the equipment, and the low dollar consumable and high usage items that may be stored on site. Site spares will be determined by ARN-200/Requirements.
- 2) Depot stock: FAALC will establish and maintain exchange and repair (E&R) stocks that will backup the LRUs delivered with the equipment. Depot spares will be identified by FAALC during the provisioning conference.

### **4.1 PROVISIONING**

The Communications Product Division, AML-6000, is responsible for generating the provisioning technical documentation (PTD) listed below. The hard copy PTD will be generated from the LSAR data provided by Litton Denro on magnetic media. The PTD is required by the FAALC to provision for:

- 1) Long lead-time items;
- 2) Provisioning parts (including parts peculiar);
- 3) Tools and test equipment;
- 4) Common and bulk items list;
- 5) Repairable items;
- 6) Design change notices.

#### **4.1.1 Provisioning Conference**

A provisioning conference has been conducted for the ETVS. The purpose of the conference was to identify the candidate LRUs and depot level spares that will be stocked at FAALC to support the ETVS. At the provisioning conference, Litton Denro provided non-proprietary engineering data for provisioning (EDFP) and non-proprietary master pattern and plan view of parts layouts. During the conference, Litton Denro provide support services, e.g., technical personnel to disassemble equipment for inspection, meeting/conference room, and access to telephones, reproduction, and facsimile equipment. Litton Denro make available for reference during the conference(s) both nonproprietary and

proprietary data, e.g., engineering data for provisioning (EDFP), technical and engineering drawings for each item appearing on the LSAR, master pattern and plan view of parts layouts. After the conference, Litton Denro provided update to the LSAR database that reflected changes resulting from the conference. The FAALC will incrementally determine the types and quantities of LRUs/spares to be ordered for depot stock. These incremental depot spare buys are determined based on the number of system being deployed through a specific period of time.

## **4.2 CATALOGING**

Litton Denro has screened through Defense Logistics Services Center (DLSC) all information entered on the LSAR Table HA (Item Identification) for national stock numbers (NSNs) in accordance with paragraph 2.210.3, DOD Manual 4100.38M and the Part II Provisioning Requirements, MIL-STD-1388-2B, (DD Form 1949-3). Screening results will be documented in Table HA.

The contract includes provision for obtaining FED-STD-5 item identification data in accordance with MIL-STD-1388-1A from Litton Denro.

Items identified as proprietary in accordance with MIL-STD-1388-2B will be clearly marked and identified: "PROPRIETARY".

## **4.3 DISTRIBUTION**

AND-320 will provide funds for site spares delivered with the ETVS equipment and for the initial stock of depot spares identified as a result of the provisioning conference

- 1) AND-320 will order site spares and site equipment at the same time and Litton Denro will deliver site spares with the site equipment. Litton Denro will package site spares in reusable shipping containers that will be used during the RA/W period to ship failed LRUs back to Litton Denro for repair. (See Section 3.2.4 above).
- 2) Litton Denro will ship the E&R/depot spares ordered after the provisioning conference directly to FAALC.

## **4.4 DISPOSITION OF REPLACED EQUIPMENT AND SUPPORTING SPARES**

The disposal plan for the ETVS was prepared by ARN-200/Requirements and approved is included as Appendix E to this ILSP

## **4.5 RETURN OF UNSERVICEABLE REPAIRABLES**

The procedures for returning failed LRUs to and obtaining serviceable replacement LRUs from FAALC after the RA/W period are discuss below.

#### 4.5.1 FAALC Supply Support

After the RA period expires (i.e., one year after site acceptance), FAA sites will request replacement LRUs via the FAALC's Logistics and Inventory System (LIS); DOD sites will request replacement LRUs from FAALC via the Military Standard Requisitioning and Issue Procedures (MILSTRIP) system.

Upon receiving a LIS/MILSTRIP request, the cognizant FAALC activity will prepare FAA Form 4250-5, Equipment Return Document, and ship the document with the serviceable LRU to the site. Upon receipt of the serviceable item and the FAA Form 4250-5, the site will return the unserviceable item to the FAALC within 15 days in the packaging in which the serviceable item was received. If the FAA Form 4250-5, provided with the serviceable item is not available (i.e., because of an accelerated return of the unserviceable or loss of the document), the requestor should contact the **FAALC Customer Care Center toll free at 1-888-322-9824 or (405) 954-3793 for a replacement document.**

In some instances, the site may be directed by the FAALC to return the unserviceable LRU directly to a commercial repair facility for repair. In such cases, special shipping instructions will be provided to the site by the FAALC.

In the event LIS/MILSTRIP service is not available, assistance can be obtained from the **FAALC Customer Care Center, toll free at 1-888-322-9824 or (405) 954-3793 manned 24 hrs a day, 7 days a week.**

(Note: Information on how FAALC processes requisitions, receipts, issues, and bills transactions for Interagency Customer, e.g., DOD, is described in FAALC FAA DOD Customer Assistance Handbook (NSN 7610-01-393-1625) which can be ordered from the FAALC.

#### 4.5.2 Contractor Provided Supply Support

There are no plans to have Litton Denro to provide any field maintenance support, e.g., interim contractor maintenance and logistics support (ICMLS).

## 5.0 SUPPORT EQUIPMENT

This section identifies the support and test equipment, both common and special, and any connectors or other interface devices needed to perform site maintenance on the ETVS.

### 5.1 COMMON TOOLS AND TEST EQUIPMENT

Litton Denro is responsible for identifying the common tools and test equipment needed to support the ETVS as part of the provisioning process. After Litton Denro has identified the tools and test equipment required, AML-4000 will verify whether or not they are available in the FAALC inventory. If they are not in the inventory, AML-4000 will initiate action to procure the items required by the FAA sites. The FAALC budgets (i.e., Preplanned Direct Ship Allocation (PDSA) funds) annually for these requirements. FAA sites will order the common tools and test equipment items needed from FAALC via the LIS and reimburse the FAALC for the items using the PDSA funds.

DOD sites will obtain common tools and test equipment via DOD sources and not from the FAALC.

The following items have been identified as common tools and test equipment recommended for use on the ETVS system.

<b>Manufacturer/Model *</b>	<b>Nomenclature</b>	<b>Quantity</b>
Hewlett Packard 4934A	Transmission Test Set	2 each
Hewlett Packard	Test Leads for HP-4934A	2 each
Fluke 77	Digital VOM	1 each
Xcelite TCMB	Technician's Tool Kit	1 each
GL Electronics 8275	Alignment Tool	1 each
Switch Craft P/N CPC102K	Patch cord (maintenance speaker)	1 each

\* Or Equivalent

### 5.2 SPECIAL TOOLS AND TEST EQUIPMENT

In accordance with the contract, Litton Denro is responsible for identifying the special tools and test equipment needed when performing maintenance on the ETVS system. AND-320 will purchase the special tools and test equipment required with site's equipment and site spares. The following special tools and test equipment will be delivered with the site's equipment.

<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>
110311-001	Impedance Matching Test Adapter Assembly	1 each
610394-001	Cable Assembly, Test Cable No. 1	1 each

610394-002	Cable Assembly, Test Cable No. 2	1 each
120933-001	Circuit Card Assembly, 4U Extender	1 each
<u>610400-201</u>	<u>600-ohm load</u>	<u>1 each</u>
<u>540018-001</u>	<u>ESD protective wrist strap</u>	<u>1 each</u>
<u>540018-003</u>	<u>Wrist strap, ESD protection, w/6' cord</u>	<u>1 each</u>
<u>611049-060</u>	<u>Cable Assembly</u>	<u>1 each</u>

### **5.3 MAINTENANCE AND CALIBRATION OF TOOLS AND TEST EQUIPMENT**

Government-owned equipment will be calibrated in accordance with FAA Order 6200.4E, Test Equipment Management Handbook. DOD-owned equipment will be calibrated in accordance with the appropriate DOD standard(s).

Litton Denro-owned equipment will be calibrated in accordance with the calibration schedules prescribed by the equipment vendors.

Calibration records will be maintained for all equipment requiring calibration.

Questions concerning FAA support equipment repair, replacement or calibration should be referred to AML-4060 at (405) 954-2165.

## **6.0 TRAINING, TRAINING SUPPORT AND PERSONNEL SKILLS**

A Government/Litton Denro, ETVS Training Guidance Conference (TGC) was held on September 13, 1995. The TGC discussed, in detail, contract requirements such as the: training task and skills analysis (TASA), contractor's training plan, format for training deliverables, review and delivery schedules, training locations, and use of non-development item (NDI) training materials.

Litton Denro NDI training course(s) and training materials have been if they met or exceeded the Government's specified requirements and were approved by the Government. Where required, Litton Denro developed the training in accordance with FAA-STD-028B, Contract Training Programs.

### **6.1 TRAINING**

This section describes the training that is available for Air Traffic (AT) and Airway Facilities (AF) personnel.

#### **6.1.1 Air Traffic (AT) Training**

- a. AT training consists of an Operation/System Administration course.

Air Traffic training consists of two computer-based courses. These courses were developed for Government AT controllers and supervisory personnel. ETVS AT training will be conducted via the computer based instruction (CBI) training package, which was distributed to all FAA sites in the national distribution of CBI courseware in July 1998. (See section 6.1.1.c, below).

- b. Training Simulators.

The requirement for the training simulators, nondynamic and the dynamic, was deleted as unneeded.

- c. Computer Based Instruction (CBI) Operation/System Administration Course.

Performance Technologies International, Inc (PTI), a sub-contractor to Litton Denro, completed the development of the AT computer based instruction (CBI) Operation/System Administration Course in June 1998. ATX-100 stated that all FAA AT controllers and supervisory personnel will be trained on the ETVS system using the CBI training package and a conventional briefing developed by each site on site-specific information. DOD has indicated that their AT controllers will also be trained using the CBI training package.

The CBI courseware operates on the FAA CBI platform. If there are any questions about the courseware, contact Mike Coffelt, ATX-100, at (405) 954-0786. If there are problems enrolling in the courses or installing the CBI courseware, contact the CBI hotline at (405) 954-4568.

The CBI courseware is divided into two separate courses. **Course 57066, ETVS Touch Entry Device (TED)** is required for all air traffic control specialist and supervisory personnel. It provides instruction and practice on the basic operation of the TED. **Course 57068, ETVS Supervisor Configuration Terminal (SCT)** is required for all supervisors and staff who will be responsible for reconfiguring the system to meet specific site requirements.

- 1) The Operation courseware permits the student via computer keyboard manipulation or mouse activation, as appropriate, to selectively display on the computer monitor typical operator position equipment for the TED, and to operate the controls displayed on the screen. The software responds to student control adjustments by simulating expected equipment responses, e.g., microphone activations, audible responses, visual displays, etc. The **TED CBI Course is 4 hours long** and consists of the following modules:
  - (a) Introduction
  - (b) Operator Position, i.e., TED or MHK
  - (c) Air-Ground Functions
  - (d) Ground-to-Ground Functions
  - (e) Special Functions (call forwarding, air/ground – ground/ground coupling, conference calls, transfer calls, forward calls, etc.,)
  - (f) Position Confidence Test
  - (g) Practice (end of practice summary provides recommended modules the student should review before taking the test)
  - (h) Test
- 2) The Supervisor Configuration Terminal (SCT) courseware builds on the training provided in the Operation's module and incorporates the generic configuration software and map sets to replicate typical system responses and visual displays the student would normally observe at a supervisor's console. Configuration changes executed by the student will result in expected changes to the designated operator position(s). The SCT course emphasizes the mechanics of moving through the configuration events and the flow of data input needed for ETVS initial start-up. The **SCT CBI Course is 4 hours long** and consists of the following modules:
  - (a) Introduction
  - (b) Basic Operations
  - (c) Local Maps
  - (d) on-line Operations
  - (e) Special Supervisory Functions
  - (f) Print, View, and Help Functions

- (g) Practice
- (h) Test

Each site scheduled to receive an ETVS will enroll their staff and controllers in the appropriate courses on the CBI platform to enable completion of the training prior to system delivery.

After the completion of the CBI training course, the site is responsible for providing the controllers with a structured site specific ETVS system's briefing that contains information unique to their site. This will primarily consists of the button labels and the destination of each button. During this briefing, the controller must be provided an opportunity for hands-on time on the actual equipment to verify what they learned in the CBI. The intent of the hands-on time is to provide a "comfort level" for the controller on the equipment. The amount of time required to achieve this is at the discretion of the supervisor or staff specialist who provides the briefing. There is no required check-out on the actual equipment. Controller ability on the equipment functionality was demonstrated in the test within the CBI.

If the CBI was completed more than 30 days prior to commissioning of the system, the controller should be provided an opportunity to retake the practice module of the CBI course. This practice provides an opportunity to perform all the controller tasks on the TED.

### **6.1.2 AF Training**

#### **a. ETVS Orientation Course.**

The Orientation course provides an overview of Litton Denro's installation and testing procedures and provides a detailed orientation on ETVS functionality and site operator and maintenance personnel responsibilities. This training was provided to the personnel who participated in the Government's Operational Test and Evaluation (OT&E) conducted at the William J. Hughes Technical Center (WJHTC) and to personnel who would be involved with the installation and testing, e.g., site acceptance testing (SAT), activities. The Orientation course taught by Litton Denro at their Gaithersburg, MD facility that was assigned a Course Number 48232.

The Orientation course can be augmented by AND-320/ASU-330 to include ETVS contract information of interest to Government Technical Onsite Representatives (TORs) and Region Facilities and Equipment (F&E) personnel. All regions were represented in the two augmented classes conducted in 1996. The augmented Orientation course was taught by an FAA Academy instructor and was assigned Course Number 45010. Request for this training/course should be submitted to AFZ-100.

Both the basic and the augmented Orientation courses are 24 hours long.

b. ETVS Hardware (HW) Maintenance Course.

This course provides, as a minimum, detailed technical instructions, including hands-on training, and is intended for site maintenance communications specialists/technicians who will be responsible for site/field maintenance of the ETVS system. Participants in this course should be electronics technicians or engineers knowledgeable about the repair of communications switching equipment.

An ETVS training system was installed at the FAA Academy (FAAAC), AMA-410, in May 1997 for hardware maintenance training. The first four classes (Course Number 48251, July – October, 1997) conducted at the FAAAC were taught by Litton Denro. FAAAC (AMA-410) instructors began teaching the **HW Maintenance Course, Course Number 40041**, in September 1997.

AFZ-100 assigns training quotas for this course in the FAA's Consolidated Personnel Management Information System (CPMIS). The **HW maintenance course is 96 hours long** and each class will accommodate up to twelve (12) students.

c. Engineering Support Services (ESS) Course.

This course will be primarily for AOS-510 and will provide, as a minimum, detailed technical instructions, including hands-on training for the personnel responsible for second level hardware, software, and firmware support, for the ETVS equipment/system. Participants in this course should have completed the ETVS HW Maintenance Course, be proficient in programming software, and be capable of identifying engineering solutions to technical hardware and software problems.

d. Depot Maintenance Training.

In the event Litton Denro decides to stop providing depot repair for the ETVS, an option exist in the ETVS for the Government to obtain the training needed by its technicians to perform the repair. If ordered by the Government, this course will provide, as a minimum, detailed technical instructions to enable depot maintenance technicians to use test program sets and automated test equipment to diagnose, isolate, and correct faults down to the component level. Government depot maintenance technicians will be trained to perform repairs at the same level of expertise they are performed under contractor maintenance.

The contract also requires Litton Denro to deliver a recommended list of materials and equipment, including the tools, test equipment, and documentation, to support depot maintenance training. The supporting documentation will detail circuits to the schematic level. Training materials will be subject to Government approval and will be delivered to the Government without restrictive legend(s).

Government personnel selected to participate in this training will have the qualifications required for personnel participating in the ETVS Hardware Maintenance Course and have had at least three years of depot maintenance or equivalent experience.

Depending on the availability of equipment, depot maintenance training will be conducted either at the Litton Denro facility, Gaithersburg, MD or at the FAA's Mike Monroney Aeronautical Center, in Oklahoma City, OK. The Contractor will provide a complete set of all training course materials to each student receiving training.

### **6.1.3 Attrition Training**

ETVS sites are responsible for AT Operation/System Administration attrition training using the CBI training course. AF attrition training is managed by AFZ-100 and training will be conducted by AMA-410 at the FAA Academy.

## 7.0 DIRECT WORK STAFFING

Electronics technicians experienced in switching systems and computer interfaces are required to support the ETVS maintenance requirements. Maintenance staffing levels derived by AFZ-200 in accordance with FAA Order 1380.40C and FAA Order 1375.4A are presented in Table 7.0-1.

TABLE 7.0-1 ETVS DIRECT WORK REQUIREMENTS

Facility Code	Class	Number of Switching Positions	System Specialist Staff Years		
			Recurring	Non Recurring	Total
48HB	B	5-8	0.036	0.179	0.215
48HB	C	9-12	0.038	0.179	0.217
48HB	D	13-18	0.040	0.179	0.219
48HB	E	19-24	0.042	0.179	0.221
48HB	F	25-30	0.044	0.179	0.223
48HB	G	31-35	0.046	0.179	0.225
48HB	H	36-40	0.048	0.179	0.227
48HB	J	41-45	0.050	0.179	0.229
48HB	K	46-50	0.052	0.179	0.231
48HB	L	51-55	0.054	0.179	0.233
48HB	M	56-60	0.056	0.179	0.235
48HB	N	61-65	0.058	0.179	0.237
48HB	P	66-75	0.061	0.179	0.240
48HB	Q	76-100	0.073	0.179	0.252
48HB	R	101-125	0.079	0.179	0.258
48HB	S	126-160	0.084	0.179	0.263

## **8.0 MAINTENANCE SUPPORT FACILITIES**

This section describes space and facility requirements for maintenance of the ETVS components and for storage space for spares and support equipment.

### **8.1 LITTON DENRO RESPONSIBILITIES**

Litton Denro is configuring the ETVS in accordance with the ETVS specification and to fit within existing facilities. Litton Denro will identify any special support facility requirements to the Government.

### **8.2 GOVERNMENT RESPONSIBILITIES**

The Government has not identified any requirements for special maintenance support facilities.

## **9.0 PACKAGING, HANDLING, STORAGE, AND TRANSPORTATION (PHS&T)**

As specified in the ETVS contract, Litton Denro will provide all PHS&T requirements in accordance with ASTM-D-3951, Standard Practices for Commercial Packaging; MIL-STD 2073-1, DOD Material Procedures for Development and Application of Packaging Requirements; MIL-STD 129L, Marking for Shipment and Storage; and FAA Order 4650.30D.

### **9.1 PRESERVATION, PACKAGING, AND PACKING**

All components and equipment (except spares) with a consignee other than the FAALC will be preserved, packaged, and packed in accordance with ASTM-D-3951.

All components and equipment (except spares) consigned to the FAALC will be individually preserved and packaged Level A and packed Level B in accordance with Appendix A of MIL-STD 2073-1.

Spares will be preserved and packaged Level A and packed Level C in accordance with MIL-STD 2073-1.

Common hardware items will be packaged in multiple unit pack quantities as normally supplied through retail channels or in standard commercial unit packed quantities compatible with the "factors and formula establishing Quantity Unit Pack (QUP) and Intermediate Container Quantity (ICQ)", will be used as a guide in determining the quantity per container.

Kits will be preserved and packaged Level A and packed Level C in accordance with Appendix E of MIL-STD 2073-1.

Exchange and Repair items must be packaged in accordance with paragraph 3.26.3 of MIL-STD 2073-1.

Electrostatic Discharge Sensitive Items must be wrapped with cushioning and be packaged in an anti-static bag. The contractor shall perform packaging for depot spares only to the FAALC, using the electrostatic discharge sensitive heat sealed bags.

### **9.2 HANDLING AND MARKING**

All components, equipment and spares with a consignee other than the FAALC will be marked in accordance with the marking requirements of ASTM-D-3951. In addition, each unit, intermediate, and the exterior shipping container will be marked with the following information:

- a. Equipment serial number;
- b. Manufacturer's part number;
- c. Manufacturer address;

- d. Warranty expiration date;
- e. Contract number;
- f. Contract line item number;
- g. National Stock Number; and,
- h. Quantity.

All components, equipment, and spares consigned to the FAALC will be marked in accordance with MIL-STD 129L. In addition, each unit, intermediates, and the exterior-shipping container will be marked with the following information:

- a. Serial number;
- b. Part number;
- c. Warranty expiration date;
- d. Contract number; and,
- e. Contract line item number.

### **9.3 STORAGE**

In the event the FAALC has to plan for storage of equipment, Litton Denro will coordinate and provide the following information before FAALC will accept the storage commitment:

- a. Item name;
- b. National Stock number;
- c. Unit Weight;
- d. Unit Dimension; and,
- e. Special Storage Requirements.

### **9.4 TRANSPORTATION**

The Government and Litton Denro will use the established FAA guidelines for shipping and transporting E&R LRUs by the most economical means available.

- a. All shipments will be made in accordance with FAA Order 4650.22D, Management and Control of National Airspace System Facilities and Engineering (F&E) Project/Materiel, dated May 4, 1993.
- b. Components, equipment, and spares will be transported by the most economical means considering dependability, safety, urgency of need, and the use of the least costly mode meeting these considerations. All material must be shipped freight/free on board (FOB) destination.

## **10.0 TECHNICAL DATA REQUIREMENTS**

This section discusses the ETVS product technical data requirements for documentation developed by Litton Denro for the Government.

### **10.1 TECHNICAL MANUALS**

Litton Denro will deliver the technical manuals described below.

Litton Denro will deliver the manuals and technical instruction book (TIB) in both hard copy and magnetic media; and without restrictive legends on the reproduction or use of any of the information contained therein.

#### **10.1.1 Operator's Manual (NSN: 0056-00-480-0440)**

Litton Denro will deliver an operator's manual in accordance with the ETVS contract for Government review and approval. The manual will provide the user with a guide to the ETVS console position equipment. The manual will provide: a general description of the position equipment and its capabilities; a description of the position equipment controls available to the operator and the indicators presented during operation; position turn-on and checkout information; and operational procedures for radio, telephone and intercom communications control. Copies of the operator's manual will be delivered with the site's equipment.

#### **10.1.2 Supervisor Configuration Terminal (SCT) User's Manual (TI 6650.53, NSN: 0056-00-480-0439)**

Litton Denro will deliver a supervisor configuration terminal (SCT) user's manual in accordance with the ETVS contract for Government review and approval. The manual will provide the information necessary for the user to operate the SCT provide with the ETVS. The manual will provide: a general description of the SCT and its capabilities, including a description of the keyboard; instructions for operating the SCT; and a glossary of the terms used in the manual. The SCT runs in a Windows utility program installed in Microsoft Windows on a personal computer (PC). Users of the SCT should be knowledgeable in the use of a PC, have experience in using Microsoft Windows programs, and understand the DOS operating system. Copies of the SCT User's manual will be delivered with the site's equipment.

#### **10.1.3 Technical Instruction Book (TIB)**

AOS-510 is the Government proponent for the ETVS technical instruction book (TIB). Litton Denro is developing the TIB in accordance with FAA-D-2494/b and will deliver the TIB for Government review and approval. The TIB will include data and commercial drawings on all NDI and custom items (e.g., memory, input/output element, interface adapter, power supplies, and each type of computer-oriented

peripheral equipment) in the ETVS and will include instructions describing the installation, operation, and site maintenance of all hardware, firmware, and software provided under this contract. The information will be of sufficient detail to allow a maintenance technician to perform site maintenance tasks.

The TIB will include a level of detail on the hardware, firmware, and software and their interaction to provide Government personnel a thorough understanding of all ETVS functions. The organization, content, and level of detail of the instruction books will be such that ETVS problems and problems concerning interfaces with external systems and devices, can be diagnosed and corrected by trained Government maintenance personnel using the instruction book as a reference. All drawings and associated lists will provide sufficient information to permit Government maintenance, modification, and engineering analysis of any commercially developed item.

The instruction book will be divided into two volumes.

- a. Volume I (**TI 6650.53, NSN: 0056-00-480-0436**) will contain the level of detail required to enable a trained maintenance person to identify hardware, software, or firmware line replaceable unit (LRU) failures and will enable the individual to replace the faulty LRU. Volume I will be a stand-alone document and will be distributed to the site level. After Government approval of Volume I, Litton Denro will deliver two copies to each Regional Associate Program Manager (RAPM) and one copy to each site.
- b. Volume II (**TI 6650.53, NSN: 0056-00-480-0437**) will contain the level of detail required to enable a trained maintenance support engineer to isolate system failures to the hardware component, software module, or firmware component level. Volume II will be used in combination with Volume I and will replicate only essential information from Volume I needed to support the continuity of the component level discussion. The distribution of the approved Volume II will be controlled by AOS-510 and will be primarily to FAA/DOD second level support organizations.

## **10.2 QUALITY CONTROL**

Litton Denro will provide and maintain a quality control system in accordance with the ETVS contract. The quality control system will apply to all aspects of the contract, and will be in accordance with the approved Quality Control System Plan (QCSP).

## **10.3 LIFE CYCLE PARTS AND SERVICE DATA**

Litton Denro will establish and maintain an escrow account containing a complete set of the technical documentation, including proprietary information, for the ETVS system. Changes approved under Litton Denro's configuration management program will be applied to the data in escrow. The escrow account will include the following data:

- a. Product drawings and associated lists;
- b. Special inspection equipment drawings and associated lists;
- c. Special inspection equipment operating instructions;

- d. Special inspection equipment calibration procedures; and,
- e. Special tooling drawings and associated lists.

Litton Denro will develop, deliver, and maintain an index of technical data contained in the escrow account. The index will be kept current for the duration of this contract.

Litton Denro will document in a technical data package validation report that the data in the escrow account and elements thereof conform to the contractual requirements, and accurately depict the hardware developed or produced under the contract. Use of the technical data in the escrow account to produce, inspect and test satisfactory hardware is considered acceptable evidence that the validation requirement has been met.

Litton Denro will make the data in escrow available for periodic Government review and inspection; and will support the Governments review and inspection. AND-320, ARN-200 and AML-6000 will determine when periodic reviews and inspections are necessary.

Litton Denro will provide a source for repair, service, and replacement LRUs/parts for the ETVS during the entire period of this contract. In accordance with the ETVS contract, Litton Denro agreed to a complete and unconditional release of the data in escrow and depot test bed at a price to be negotiated, if Litton Denro stops supporting the ETVS system.

When ordered by the Government, Litton Denro will provide a depot maintenance transition plan that identifies all resources that the Government will require to assume full support of the ETVS.

#### **10.4 CONFIGURATION**

Litton Denro provided a Configuration Management Plan (CMP) in accordance with MIL-STD-973, Appendix A. The CMP documents the procedures for baseline identification and control, audits, and status accounting of the ETVS system hardware, software, firmware, and documentation and support equipment throughout the contract life cycle. Configuration Management will be applied to the maintenance of the escrow data to ensure that this data reflects the current system configuration.

## **APPENDIX A. REFERENCED DOCUMENTS**

### **Department of Defense (DOD) Document**

DOD Manual 4100.38M      DOD Provisioning and Procurement Screening Manual

### **Federal Aviation Administration (FAA) Specifications**

FAA-D-2494/B      Technical Instruction Book Manuscript: Electronic, Electrical and Mechanical Equipment, Requirements for Preparation of Manuscript and Production of Books, March 14, 1984

FAA-G-1375C      Spare Parts-Peculiar for Electronic, Electrical, and Mechanical Equipment, April 21, 1988

### **Federal Aviation Administration (FAA) Standards**

FAA-STD-028B      Contract Training Programs, May 1, 1993

### **Federal Aviation Administration (FAA) Orders**

FAA Order 1380.40C      Airway Facility Sector-Level Staffing Standard System, January 17, 1986

FAA Order 1800.58A      National Airspace Integrated Logistics Support Policy, August 19, 1993

FAA Order 4560.1B      Policies and Procedures Covering the Provisioning Process during the Acquisition of FAA Material, March 10, 1989

FAA Order 4650.30D      Management and Control of NAS F&E Project/Materiel, May 4, 1993

FAA Order 4800.2C      Utilization and Distribution of Excess and Surplus Personnel Property

FAA Order 6000.30B      Policy for Maintenance of the National Airspace System (NAS) Through the Year 2000, October 8, 1991

FAA Order 6200.4E      Test Equipment Management Handbook, November 26, 1991

### **Federal Aviation Administration (FAA) Contracts**

DTFA01-94-C-00026	Operational Support Telephone System (OSTS) Contract, March 14, 1994
DTFA01-95-C-00027	Enhanced Terminal Voice Switch (ETVS) Contract, July 26, 1995
DTFA01-95-Y-01014	Voice Switch Bypass (VSBP) Contract, August 23, 1995

### **Federal Aviation Administration (FAA) Memorandums**

AAF-1 Memorandum	Disposition Decisions for Replaced Equipments, October 1, 1992
ARN-200 Memorandum	Maintenance Repair Support for Headsets/Peripherals on Voice Switching Systems, July 29, 1998

### **Federal Aviation Administration (FAA) Manuals/Handbooks**

NSN 0056-00-480-0436	ETVS Technical Instruction Book (TIB), Volume I (TI 6650.53)
NSN 0056-00-480-0437	ETVS Technical Instruction Book (TIB), Volume II (TI 6650.53)
NSN 0056-00-480-0439	ETVS Supervisor Configuration Terminal (SCT) User's Manual (TI 6650.53)
NSN 0056-00-480-0440	ETVS Operator's Manual
NSN 7610-01-393-1625	Federal Aviation Administration Department of Defense (DOD) Customer Assistance Handbook, First Edition 1995

### **Military (MIL) Standards**

MIL-STD-129L	Marking for Shipment and Storage, October 15, 1990.
MIL-STD-973	Configuration Management, April 17, 1992
MIL-STD-1388-1A	Logistic Support Analysis, January 21, 1993
MIL-STD-1388-2B	DOD Requirements for a Logistic Support Analysis Record, January 21, 1993
MIL-STD-2073-1	DOD Material Procedures for Development and Application of Packaging Requirements

### **Non-Government Standards**

ASTM-D-3951	Standard Practices for Commercial Packaging, March 1983
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### **Forms**

DD Form 250	Material Inspection and Receiving Report
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DD Form 1949-3	Logistics Support Analysis Record (LSAR) Data Requirements
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FAA Form 4250-5	Equipment Return Document
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## **APPENDIX B. ACRONYMS**

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ADP Automatic Data Processing

AF Airway Facilities

AFB Air Force Base

A/G Air-to-Ground

APL Associate Product Lead

APLL Associate Product Lead for Logistics

APLNI Associate Product Lead for NAS Implementation

ASD Assistant Secretary of Defense

ASTM- American Society for Testing and Materials

AT Air Traffic

ATC Air Traffic Control

ATCALS Air Traffic Control & Landing Systems (DOD)

ATCT Airport Traffic Control Tower

ATIS Automatic Terminal Information Service

ATS Administrative Telephone System

C<sup>3</sup>I Command, Control, Communications & Intelligence

CBI Computer Based Instruction

CCT Configuration Control Terminal

CDRL Contract Data Requirements List

CIP Capital Investment Plan

CLIN Contract Line Item Number

CM Configuration Management

CMP Configuration Management Plan

CO Contracting Officer

COTR Contracting Officer Technical Representative

COTS Commercial Off-The-Shelf

CPMIS Consolidated Personnel Management Information System

CRS Contractor Repair Services

CST Central Standard Time

CTD Communications Traffic Data

DA Direct Access

DCN Design Change Notice

DLSC Defense Logistics Services Center

DMTP Depot Maintenance Transition Plan

DOD Department of Defense

E&R Exchange and Repair

EDFP Engineering Data for Provisioning

EEM Electronic Equipment Modification

ESC Engineering Systems Command (DOD)

ETVS Enhanced Terminal Voice Switch

F&E Facilities and Equipment

FAA Federal Aviation Administration

FAAAC FAA Academy

FAALC FAA Logistics Center

FAT Factory Acceptance Test

FOB Freight/Free On Board

FPF Not an acronym; basic LCN identifier code applicable to ETVS

G/G Ground-to-Ground

GSA General Services Administration

GSIP Generic Site Implementation Plan

HW Hardware

ICQ Intermediate Container Quantity

ICSS Integrated Communications Switching System

IFR Instrument Flight Rules

ILS Integrated Logistics Support

ILSP Integrated Logistics Support Plan

IM Item Manager

IOC Initial Operational Capability

IOM Installation, Operation, and Maintenance

IOT&E Independent Operational Test & Evaluation

IPL Integrated Product Lead

IPT Integrated Product Team

ISD In Service Decision

ISP Integrated Support Plan

JPCO Joint Program Coordinating Office (DOD)

JPO Joint Program Office (DOD)

L&T Logistics and Training

LCD Liquid Crystal Display

LCN Logistics Support Analysis Control Number

LIS Logistics and Inventory System

LRU Line Replaceable Unit

LSA Logistics Support Analysis

LSAR Logistics Support Analysis Record

MDT Maintenance Data Terminal

MHK Membrane Hardkey

MIL-STD- Military Standard

MILSTRIP Military Standard Requisitioning and Issue Procedures

MIS Management Information System

MMAC Mike Monroney Aeronautical Center

MOA Memorandum of Agreement

MRC Monthly Recurring Charge

MRD Maintenance Requirements Document

NAILS National Airspace Integrated Logistics Support

NAILSMT National Airspace Integrated Logistics Support Management Team (NAILSMT)

NAS National Airspace System

NDI Nondevelopmental Item

NISC NAS Implementation Support Contractor

NSN National Stock Number

OEM Original Equipment Manufacturer

OSTS Operational Support Telephone System

OT&E Operational Test & Evaluation

P<sup>3</sup>I Preplanned Product Improvement

PASS Professional Airway System Specialists

PBFA Policy Board for Federal Aviation

PC Personal Computer

PCA Physical Configuration Audit

PHS&T Packaging, Handling, Storage, and Transportation

PIP Product Implementation Plan

PL Product Lead

PM Program Manage

POC Point of Contact

PTD Provisioning Technical Documentation

PTI Performance Technologies International, Inc

QA Quality Assurance

QCSP Quality Control System Plan

QRO Quality & Reliability Officer

QUP Quantity Unit Pack

RAPM Regional Associate Program Manage

RA Reliability Assurance

RDVS Rapid Deployment Voice Switch

RMMS Remote Maintenance Monitoring Subsystem

SAG Senior Advisory Group

SAT Site Acceptance Test

SCT Supervisor Configuration Terminal

SIP Site Implementation Plan

SOW Statement of Work

STVS Small Tower Voice Switch

SW Software

TASA Task and Skills Analysis

TBD To Be Determine

TECHEVAL Technical Evaluation

TED Touch Entry Device

TIB Technical Instruction Book

TGC Training Guidance Conference

TOR Technical Onsite Representative

TRACON Terminal Radar Approach Control

TVSR Terminal Voice Switch Replacement

UHF Ultra High Frequency

UPS     United Parcel Service

VHF   Very High Frequency

VSBP Voice Switch Bypass

VSCS Voice Switching and Control System

WJHTC William J Hughes Technical Center

## **APPENDIX C. DEFINITION OF TERMS**

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National Airspace Integrated Logistics Support (NAILS): A disciplined, approach to plan and integrate support considerations into design, acquire the necessary initial support for the subsystem/equipment, and identify life-cycle support requirements.

National Airspace Integrated Logistics Support Management Team (NAILSMT): A team formed for each acquisition which identifies requirements and plans and coordinates and integrates a logistics structure which will ensure systems are supportable prior to deployment. The team includes a representative for each logistics element.

Commercial Off-The-Shelf (COTS). Equipment fully developed and manufactured by a commercial vendor and for sale to the general public in the course of normal business operations at prices based on established catalog or market prices. (Source: FAA Order 4560.1B)

Contractor Repair Service (CRS). A maintenance and repair service provided by the contractor.

Exchange and Repair (E&R). Any hardware LRU, except expendable, when unserviceable, is returned to the contractor after a serviceable replacement.

Integrated Logistic Support (ILS). An interrelated, unified, and iterative approach to the management and technical activities that cause support considerations to influence requirements and design, defines support requirements that have an optimal relationship to the system design and to each other, results in acquisition of the full range of system support requirements, and ensures support during system operation at minimum cost.

Integrated Logistics Support Plan (ILSP). A plan describing the government's detailed approach for integrating logistic considerations and logistic planning into the engineering and designing process for each NAS subsystem (Source: FAA Order 4560.1B).

Integrated Support Plan (ISP). The total comprehensive plan prepared by the contractor, for management of the ILS program requirements contained in the contract or request for contractor proposal. The ISP is the consolidation of all individual logistics support element plans into an interrelated, interfaced, and phased program to provide effective and timely logistics support for a designated system/equipment/subsystem/component. It is the contractor's version of the Government's ILSP.

Line Replaceable Unit (LRU). An item which may consist of a unit, an assembly (circuit card assembly, electronic component assembly, etc.), a subassembly, or a part, that is removed and replaced at the site-maintenance level to restore the system/equipment to its operational status (Source: FAA Order 4560.1B).

The lowest unit to be replaced within the system during site maintenance. It is a separate, installable, physical package performing a single function or group of closely related functions.

Logistic Support Analysis (LSA). The selective application of scientific and engineering efforts undertaken during the acquisition process, as part of the system engineering and designing process, to assist in complying with supportability and other integrated logistic support objectives (Source: FAA Order 4560.1B).

Logistics Support Analysis Record (LSAR). That portion of LSA documentation consisting of detailed data pertaining to the identification of logistic support resource requirements of a system/equipment (Source: FAA Order 4560.1B).

Monthly Recurring Charge (MRC). Denro is responsible for depot level repair for the ETVS life cycle. For this service, Denro charges each site a monthly recurring charge in accordance with CLIN 0011, Contractor Repair Services, of the ETVS contract.

Test Equipment. Electronic, electrical, mechanical, or optical instruments, both common and specially designed, necessary for servicing, testing, adjusting, and maintaining the end article.

- a. Special: Test equipment designed and developed by the prime contractor or its vendors to perform a specific operation on specific pieces of material necessary for servicing, testing, adjusting, and maintaining the end article.
- b. Common: Test equipment, which is not covered in the definition of special. (Source: FAA

## **APPENDIX D. POINTS OF CONTACT LIST**

### **AND-320, OFFICE OF THE INTEGRATED PRODUCT LEAD (IPL)**

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- Ed Hand, Implementation/Product Engineer	4792
- Jenny Perez, Product Engineer	4796
- Andy Michel, COTR VSBP/DVRS	4797
- Curtis Porter, COTR RDVS-IIA	4798
- Kent Cheung, CEXEC	554 4530
	X117

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- Bill Howard (acting)	(202) 493-0707
------------------------	----------------

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- Bill Howard, AF Requirements	493-0707
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**ACT-340C, Test & Evaluation, WJHTC**

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- Jim Sanzone (405) 954-5149

- Don A. Smith 0284

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(405) 954-3583, 1630-0800 CST evenings, weekends, holidays

**AND-6/Joint Program Coordinating Office (JPCO)**

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- Cpt Reuben Ratcliff (202) 493-5040

- Susan Gospill, APEX 267-3756

**JPO/ESC & U.S. Air Force**

---

- Bill Powers, ESC/GA (781) 377-9111

- Fred Britton, ESC/GA 9032

**U.S. Army**

---

- Ronnie Tucker, PM ATC (205) 955-8992

- Joe DiCamello, CECOM (732) 532-2559

**U.S. Navy (NAVAIRSYSCOM)**

---

- Kevin Wood, PM Air Stations (301) 862-6321

- Ron Smith, APML 6310

**MIKE MONRONEY AERONAUTICAL CENTER (MMAC)**

**AMP-1A, NAS Program Management**

- Kenneth Frengs (405) 954-8537

- C.R. Blankenship, NISC 8574

**FAA LOGISTICS CENTER (FAALC)**

**AML-6000, Integrated Products Management**

- Regina West (405) 954-5627

**FAALC Customer Care Center**

Toll free 1-888-322-9824 or (405) 954-3793 manned 24 hours a day, 7 days a week

**FAA ACADEMY (FAAAC)**

**AMA-410, Airway Facilities Training**

- Michael McKenzie (405) 954-3631

- Celeste Roth, ETVS 4424

**AMA-551, Air Traffic Training**

- Ron Ward

8151

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**AAL Alaska Region**

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**ACE Central Region**

- Doug Edwards ANI-500, RAPM

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**AGL Great Lakes Region**

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**ANE New England Region**

- Jack Emberg ANI-100, RAPM

(617) 238-7808

**ANM Northwest Mountain Region**

- Jackie Baldwin ANI-800, RAPM

(206) 227-2435

**ASO Southern Region**

- Steve Duckett ANI-300 RAPM

(404) 305-6527

**ASW Southwest Region**

---

- Melissa Nelson ANI-600, RAPM

(817) 222-4680

- Rich Anderson, NISC

4215

**AWP Western Pacific Region**

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- Gary Pettengill ANI-900, RAPM

(310) 725-3495

## **EQUIPMENT CONTRACTORS**

### **Litton Denro, Incorporated (ETVS)**

---

#### **HOTLINE 1-800-952-2505**

- |   |                |
|---|----------------|
| - Eddy Forman, PM                         | (301) 840-1597 |
|   | x414           |
| - Bob Matthews, Dir of Technical Services | x162           |
| - Ed Audibert, Depot                      | 869-1628       |

### **DME Corporation (VSBP)**

---

- |  |                |
|--|----------------|
| - Reception                              | (954) 975-2100 |
| - Deborah Lapenta, PM                    | 2214           |
| - Rick Kimmell, Customer Product Support | 2176           |
| - Ron Driest, FAA QRO                    | 2260           |

### **Executone Information Systems (OSTS)**

---

#### **HOTLINE 1-800-678-9866**

**Performance Technologies International, Inc (PTI) – ETVS CBI Training**

- Andrew Coile (703) 256-4796
- Nick Atiyeh 4796

**Plantronics (headsets)**

- Gareth Weldon (804) 985-8422

## **APPENDIX E. DISPOSAL PLAN**



# **VOICE SWITCH DISPOSAL PLAN**

December, 1998

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Stephen R. Dash

Team Lead

Voice Switching and Recording

Product Team, AND-320

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## **1.0 Introduction**

### **1.1 Purpose**

The goal of this plan is to assist in the systematic removal of voice switching equipment end items, spares and peculiar support equipment from the FAA inventory as they are to be replaced by the Enhanced Terminal Voice Switch (ETVS) and Rapid Deployment Voice Switch (RDVS) IIA. In support of this goal, this plan addresses the requirements of FAA Order 4800.2, Utilization and Disposal of Excess Personal Property. This plan will serve to augment procedures established in Order 4800.2C and to address foreseeable changes in strategy. It is intended for distribution to all Regions, System Management Offices (SMO) and facilities with voice switches described herein. This plan will be made an attachment to Integrated Logistics Support Plans (ILSPs) for the voice switches to which it pertains and affects only FAA facilities. It does not apply to Department of Defense (DOD) facilities.

#### **1.1.1 Strategy**

It shall be the strategy of the Voice Switching and Recording Integrated Product Team (VSRPT), AND-320, to affect removal of the affected equipment and systems from the NAS, to reutilize assets to the maximum extent practical and to conserve support resources consistent with optimum life-cycle cost. An integral part of this strategy will be utilization of a Telco Leased Telecommunications Program Division, AOP-500, contract with Lucent Technologies/AT&T (referred to herein as Lucent) to affect removals and disposal of the Integrated Communications Switching System (ICSS). In the absence of this resource, disposal will be handled locally through the processes defined in FAA Order 4800.2C.

Upon removal of the affected equipment, the Communications and Navigation Division, ARN-200, will coordinate cessation of support with the Regions and subsequently request the FAA Logistics Center (FAALC) to dispose of excess materials. Equipment which is declared as excess shall be disposed of in accordance with existing FAA policy and procedures as described herein. Further support to recipients of such equipment through sale or donation will not be available.

Total disposal shall be managed in accordance with the Federal Property Management Regulations (FPMR). Deviations from the procedures herein shall have prior approval from the VSRPT.

Questions regarding the disposal of equipment under this plan should be directed to Mr. Bill Howard, ARN-200, at (202) 493-0707

## **1.2 Background**

### **1.2.1 Life-Cycle Replacement System**

The ETVS and RDVS IIA programs replace some 221 electromechanical and non-supportable electronic voice switching systems. Over 70% voice switches at air traffic terminals are obsolete electromechanical, and aging analog ICSS switches installed during the 1960s, 1970s, 1980s. More importantly, these switches should be replaced before they jeopardize the safe and efficient control of commercial and general aviation aircraft. Many of the systems currently installed are unsupportable and replacement switches are mandatory to ensure the continuation of effective air traffic control services. The ETVS program is a joint FAA/DOD procurement with the majority of the DOD requirements being fulfilled in the out-years of the contract. RDVS IIA program provides for 50 to a maximum of 75 voice switches for use in medium and large terminal facilities.

### **1.3 Authorization for Removal**

Removal of voice switching equipment described herein will start only after a site receiving the ETVS or RDVS IIA has achieved Operational Readiness Date (ORD) and after Air Traffic Managers has released the equipment. Authorization to begin removing voice switch equipment is expected not later than 60 days after each ORD. Removal of equipment should be coordinated with the appropriate local/regional property disposal specialist prior to initiating the process described herein.,

Removal of supporting resources at the Mike Monroney Aeronautical Center and the William J. Hughes Technical Center (WJHTC) will begin after all equipment has been decommissioned.

### **1.4 Referenced Documents**

Documents referenced by this plan are listed below:

- A. FAA Order 4800.2C Utilization and Disposal of Excess and Surplus Personal Property
- B. FAA Order 1200.8C Public Information Activities and Programs
- C. Interagency Support Agreement (ISA) SC4403-96122-001
- D. FAA Disposal Guide Publication #329935 NSN 0056-00-480-0441
- E. Integrated Communications Switching System (ICSS) Type I  
Technical Instruction Book Volumes I and II NSN 0056-00-480-0058  
and 0056-00-480-0059

F. Integrated Communications Switching System (ICSS) Type II

Technical Instruction Book Volumes I and II NSN 0056-00-480-0097

and 0056-00-480-0098

G. Integrated Communications Switching System (ICSS) Type IA

Technical Instruction Book NSN 0056-00-480-0174

## **2.0 Affected Property**

### **2.1 System Descriptions**

#### **2.1.1 Functional Descriptions**

Voice switches provide air traffic controllers access to air-to-ground (A/G) and ground-to-ground (G/G) communications systems at control positions in Airport Traffic Control Towers (ATCT) and Terminal Radar Approach Control (TRACON) facilities. Voice switching systems are fielded as a single system per site. However, because the requirements for this capability differ between sites and because the existing equipment was procured under several contracts from different manufacturers; the configuration of each system will vary. This plan addresses the removal and disposition of a number of makes and models of voice switching equipment used in the terminal air traffic environment. Generally, this equipment can be grouped by manufacturer.

##### **2.1.1.1 AT&T/Western Electric Co (WECO)**

All AT&T and WECO manufactured switches will be removed and reclaimed by AT&T under the direction of AOP-500. These switches include:

AT&T 400

WECO 300/301A

AT&T MTCS

The AT&T/WECO switches were fielded to support air traffic communications requirements at Airport Traffic Control Towers (ATCT) and Terminal Radar Approach Control (TRACON) facilities. These switches provide voice connectivity for air/ground communications. The AT&T/WECO switches also provide voice connectivity between air traffic controller positions and other ground facilities. Such connectivity may be provided either within the same facility or between facilities.

Questions concerning the removal of these switches should be addressed to Ms. Rosalind Ward (UNITECH) at (202) 484-2534 or Mr. Michael Sullivan, AOP-500 at (202) 484-1300.

### **2.1.1.2 DENRO, Inc.**

#### **a. Denro Model 400 Integrated Communications Switching System (ICSS) Type I**

The Model 400 Type I ICSS was fielded to support air traffic communications requirements at Airport Traffic Control Towers (ATCT) and TRACONs. The ICSS provides voice connectivity for air/ground communications. The ICSS also provides voice connectivity between air traffic controller positions and other ground facilities. Such connectivity may be provided either within the same facility or between facilities. An ICSS provides interphone connectivity to a Private Automatic Branch Exchange (PBX) and transmission equipment.

#### **b. ICSS Model 400 Type III (Southern California TRACON)**

The Model 400 Type III ICSS is a variant of the Model 400 Type I normally assigned to flight service stations. The only system of this type which is to be replaced under this plan is the system at Southern California TRACON (SCT). It performs similar functions to the Denro Model 400 system described above.

#### **c. OJ-314/FSA-58**

This model was fielded to DOD sites only. Removal and disposition of these switches is the responsibility of DOD. No FAA sites are affected.

### **2.1.1.3 Litton AMECOM**

#### **a. ICSS Model 3080 Type II**

This model was fielded to support air traffic communications requirements at large TRACONs. It performs similar functions to the Denro Model 400 and Type I systems described above. This model is modular and capable of supporting a minimum of 20 ATC positions and is capable of interfacing with at least 75 interfacility trunks, 30 DDD/FTS/Autovon trunks, 75 IN-WATS trunks and 75 radio channels. Site configurations are scaled by site needs and vary in the number of positions.

### **2.1.1.4 Other Voice Switches**

Other voice switches which will be replaced by the ETVS and RDVS IIA programs include, but are not limited to, the Intellect and the CT 2000. These switches were not procured through a national program and are the responsibility of the individual sites and the regions to affect disposal. There are no national requirements for recovery or reassignment of this equipment.

### **2.1.1.5 Radio Control Equipment and Four Channel Radio Control**

This plan does not provide for removal and disposition of FA-9334, FA-8165 radio control equipment or the four channel radio control. In the absence of a specific disposal plan, this equipment should be excessed locally in accordance with FAA Order 4800.2C.

## **2.2 Descriptions of Excess Property**

Property descriptions may be found in the ICSS Technical Instruction Books (TIB) listed above to assist FAA activities, contractors, and Defense Reutilization Marketing Offices (DRMOs) in planning to receive the property.

## **2.3 Other Excess Property**

Locally procured switching equipment not specifically addressed under this plan shall be disposed of in accordance with FAA Order 4800.2C and FPMR. Local disposal through DRMOs is encouraged.

## **2.4 Planned Reclamation**

### **2.4.1 AT&T/WECO Voice Switches**

All AT&T and WECO manufactured switches will be removed and disposed of by Lucent Technologies at the direction of AOP-500 under the Vintage Switch Program.

### **2.4.2 Litton and Denro Voice Switches (ICSS)**

In order to minimize the number of shipments of reclaimed equipment and administrative actions at field sites; any equipment to be reclaimed under a national program will be removed from systems that have already been shipped to the Lucent facility in Phoenix, AZ for disassembly. The FAALC, Communications / Metrology / Power Systems Support Branch, AML-640, will be responsible for coordinating reclamation these items, if any. Unless otherwise directed, no equipment will be shipped directly from sites to the FAALC.

#### **2.4.2.1 Defense Reutilization Marketing Offices (DRMOs)**

In the absence of the AOP-500 contract with Lucent Technologies, and at the option of the individual regions and sites, the Department of Defense's Defense Reutilization Marketing Offices (DRMOs) may be used as a means of disposing of excess ICSS equipment. Information about the DRMOs, including site lists, points of contact, help line, technical support, customer service numbers, and policy assistance for recovery/reutilization issues and hazardous waste disposal may be found on the DRMS web site at [www.drms.dla.mil](http://www.drms.dla.mil).

##### **2.4.2.1.1 Interagency Agreement**

Use of DRMO facilities is supported by Interagency Support Agreement (ISA) SC4403-96122-001. The ISA provides for the transfer of Department of Transportation (DOT) excess/surplus property to DRMOs for the purpose of precious metals recovery. Under this ISA, DOD will bear the cost of

transportation from FAA facilities to the DRMO. DRMO transportation personnel have a list of approved carriers for DOD.

## **2.5 Local Requirements**

### **2.5.1 Cannibalization of Obsolete Systems**

The costs of cannibalization of obsolete systems for regional and/or site use will be borne by the respective regions.

### **2.5.2 Other Needs**

The costs of cannibalization of obsolete systems for purposes other than augmentation of site spares will be borne by the Regions. It should be noted that supply and repair support will be discontinued for those sites included in the ETVS/RDVS IIA master schedule as the old systems are removed. Support beyond these times will be the responsibility of the Regions. The Logistics and Inventory System (LIS) Utilization, Screening and Disposal (USD) subsystem may provide a source of remaining equipment.

## **2.6 Logistics Support**

### **2.6.1 Denro Voice Switches**

Type I ICSS manufactured by Denro are currently supported through a national maintenance contract funded by AOS-100. Removal of these switches should be reported to AOS-100 to the attention of Mr. Boyd LeFever at (202) 267-7405. Timely notification of removal of these switches will help to conserve scarce operations funds.

#### **2.6.1.1 Denro Voice Switch Site Spares**

Site spares supporting Denro Type I equipment are owned by Denro and are not to be disposed of with the end item. Equipment not returned to Denro may result in charges to the Government.

### **2.6.2 Litton Voice Switches**

Type II ICSS manufactured by Litton AMECOM are currently supported through a national maintenance contract funded by AOS-100. Removal of these switches should be reported to AOS-100 to the attention of Mr. Boyd LeFever at (202) 267-7405. Timely notification of removal of these switches will help to conserve scarce operations funds.

#### **2.6.2.1 Litton Voice Switch Site Spares**

Site spares supporting Litton Type II equipment are the property of Litton AMECOM and are not to be disposed of with the end item. Equipment not returned to Litton may result in charges to the Government.

## **3.0 Property Removal**

Removal of equipment will commence upon receiving authorization from the Air Traffic Managers at each site and after coordination with the Property Disposal Specialist. The Regional Associate Program Manager (RAPM) will coordinate with appropriate site and regional personnel to execute activities associated with the removal of excess equipment. Equipment, including associated cables, will be removed by site and regional personnel. Removals should coincide with the installation of the ETVS or RDVS IIA in accordance with paragraph 1.3, Authorization for Removal.

### **3.1 Disposal Issues**

Appendix (1) lists the disposal issues that are being addressed for voice switch disposal. This appendix provides issue definition, resolution and status. Where appropriate, the resolution column references disposal plan paragraphs where additional information or issue resolution is located. The table will be updated as new issues are identified and issue resolution is reached. Updates may be provided to Mr. Bill Howard, ARN-200, at (202) 493-0707, FAX (202) 366-1806 or by CC Mail.

## **4.0 Property Disposition**

### **4.1 Special Disposal Authority**

None of the voice switches which are addressed in this plan are the subject of special disposal authority.

### **4.2 Responsibilities**

Table (1) identifies personnel and organizations that will be responsible for executing elements of this plan.

#### **4.2.1 Lucent Technologies**

##### **4.2.1.1 Use of Lucent Contract**

Use of the Lucent Technologies contract will be a local/regional decision subject to availability of the contract and funding resources. AOP-500 will administrate the Lucent contract and direct contractor efforts.

##### **4.2.1.2 Scope of Contractor Effort**

Under the terms of the AOP-500 contract with Lucent Technologies, the contractor will remove excess equipment from each site as directed by AOP-500. Following receipt of a "removal" TSR from AOP-500, contractor personnel may make a site visit to survey the effort required. The contractor will subsequently remove the equipment, with the exception of contractor-owned site spares, from the site and ship it to their Phoenix facility. The scope of the contractor's work is to receive, package as required, remove the equipment and transport it from each site for final disposition. Lucent personnel shall not be utilized to disconnect equipment from the NAS including removing cables from facilities.

##### **4.2.1.3 Reporting**

The contractor will forward an inventory of the items as surplus parts and equipment to accumulate to AOP-500 support contractors on a quarterly basis. The AOP-500 support contractors will then prepare the FAA Western Pacific Region Report of Excess Personal Property Automated Worksheet. The worksheet will be approved by the AOP-500 project manager and forwarded to the Western Pacific Region Property Disposal Officer for processing. The property disposal officer will then forward disposal authorization to OTS personnel who will coordinate further processing at the Phoenix facility.

#### **4.2.2 Local Airway Facilities (AF)**

##### **4.2.2.1 Equipment Disconnection**

Local AF personnel shall be responsible for disconnection of equipment cited in this plan from the NAS and to prepare it for removal by the contractor or Government counterpart in the absence of the Lucent contract.

##### **4.2.2.2 Litton Type II Site Spares**

Local AF shall assemble site spares and arrange shipment to:

Litton Systems Inc.

AMECOM Division

5115 Calvert Road.

College Park, MD 20740-3898

Attention: Mr. Al Byrum

##### **4.2.2.3 Denro Type I Site Spares**

Local AF shall assemble site spares and arrange shipment to:

Denro

Attn. Depot Recieving

9318 Gaither Road

Gaithersburg, MD 20877

#### **4.2.3 Property Custodians**

##### **4.2.3.1 Initiate Disposal**

Regional AXX-470 personnel should prepare a Telecommunications Service Request (TSR) indicating discontinuation of service and forward it to AOP-500 to the attention of Ms. Rosalind Ward. Ms. Ward can be reached at (202) 314-4344, fax (202) 484-8032. Thirty days advance notice of removals is requested to complete the coordination process. Ensure that the TSR includes both primary and secondary points of contact. Coordination with AOP-500 should also include advising AOP-500 how the Region plans to document the excess equipment (locally or under vintage switch disposal procedures via AWP-54).

In the absence of the Lucent contract, equipment shall be disposed of in accordance with this plan and the latest version of FAA Order 4800.2.

#### **4.2.3.1.1 Sale of Equipment and Logistics Support**

Offers to sell equipment shall indicate that the FAA considers the equipment to be obsolete and no longer provides logistical or technical support for it.

#### **4.2.3.1.2 Reclaimed Items**

Reclaimed items will be removed from equipment which has been relocated to the Lucent Technologies facility in Phoenix, AZ for disassembly and final disposition.

### **4.2.4 Property Managers / Disposal Officers**

#### **4.2.4.1 Excess Reports**

Excess reports for equipment removed by contractor personnel and shipped to Phoenix, AZ will be prepared locally. Under procedures established for disposal of vintage switch equipment excess reports may be prepared by AWP-54. If the latter approach is desired then initial coordination with AOP-500 should include this subject.

In the absence of the Lucent contract, regional property managers will provide excess reports in accordance with regional procedures and the most current version of FAA Order 4800.2.

#### **4.2.4.2 Property Record Adjustment**

An adjustment to the in-use personal property records and the Facilities Systems Equipment Profile (FSEP) shall be made in accordance with regional procedures and the most current version of FAA Order 4800.2.

#### **4.2.4.3 Shipments**

Excess equipment will be shipped to Phoenix, AZ by Lucent under the AOP-500 contract using AOP-500 funds. Unless otherwise directed, no equipment will be shipped to the FAALC. Site spares belonging to Litton AMECOM must be shipped in per instructions in section 4.2.2.2 above.

Table (1) Disposal Personnel

<b>Name</b>	<b>Area of Responsibility</b>	<b>Telephone</b>
Steve Dash (AND-320)	Product Lead, VS&R PT	202-493-4782
Bill Howard (ARN-200)	APMR, VS Disposal Plan Development	202-493-0707
John Babich (ARN-200)	APMR, A/G Communications (RCE)	202-493-0709
George Clark (ARN-200)	Logistics Manager	202-493-4789
Marion Carlson (AFZ-500)	Property Management & Disposal	202-267-9686
Linda Wagner (AFZ-500)	Property Management	202-267-8860
Robert Rams (ANS-500)	Environment & Safety	202-267-7325
Ed Hand (AND-320)	Voice Switch Deployment	202-493-4792
Mike Sullivan (AOP-500)	Vintage Switches (WECO, MTCS)	202-314-7749
Rosalind Ward (Unitech AOP-500)	Switch Removal Coordination	202-314-4344
	<b>RAPMS</b>	
Melissa Nelson (ANI-610)	Southwest Region RAPM	817-222-4680
Steven LoVerde (ANI-220SL)	Eastern Region RAPM	718-553-3469
Joe Szanati (AGL-459)	Great Lakes Region RAPM	847-294-7591
David Anderson (ASO ANI-310C)	Southern Region RAPM	404-305-6294
Gary Pettengill (AWP-400)	Western Pacific Region RAPM	310-725-3495
Mel Leskinen (ANI-700)	Alaskan Region RAPM	907-271-5199
Mark Stack (ANM-450E2)	Northwest Mountain Region RAPM	206-227-2471
Ed Davis (ANE-422)	New England Region RAPM	617-238-7435
Doug Edwards (ANI-500)	Central Region RAPM	816-426-2242

<b>Name</b>	<b>Area of Responsibility</b>	<b>Telephone</b>
	<b>FAA Logistics Center</b>	
Ron Kuhlman (AML-641)	Logistics Center Equip. Specialist	405-954-5563
Chris Babcock (AML-461)	Logistics Center Engineering	405-954-5227
Pat Secrest (AML-300)	Logistics Center PHS&T	405-954-5359
Regina West (AML-6000)	Logistics Center Supply Mgmt. Division	405 954-5627
	<b>Property / Disposal Managers</b>	
Rich Piech (ACT-410)	WJHTC Disposal	609-485-6732
David Paveglio (AEA-55)	Property Manager	718-553-3052
Joy Schilling (ASW-54C)	Property Manager	817-222-4381
Adamy Martinez (AGL-74B)	Property Manager	847-294-7226
(ANE- )	Property Manager	
(ANM- )	Property Manager	
Rex Young (AAL-54B )	Property Manager	907-271-3571
Offie Baugh (AWP-54)	Property Manager	310-725-7510
Marshall Fue (ACE-52D)	Property Disposal Specialist	816-426-3396
David Houston (ASO-52A)	Property Manager	404-305-5731
Flossie Thomas (ACT-131A)	Property Manager	609-485-4158
Lynda Reiter (AMQ-1)	Property Manager	405-954-5102
Patty D. O'Sullivan (AEA-550)	Property Disposal	718-553-4987

<b>Name</b>	<b>Area of Responsibility</b>	<b>Telephone</b>
55C) Diana Rizzuto		718 553-4983
Carol Harakal(ASW-54) Janis Fifita (ASW-54A3)	Property Disposal Specialist	817-222-4381 310-725-7519
Adamy I. Martinez (AGL-74B)	Property Disposal	847-294-7226
Louis J. Landi (ACT-131A)	Property Disposal	609-485-5585
Toni D. Ferencich (AML-380)	Property Disposal	405-954-5137

**Table (1) Disposal Personnel Contd.**

	<b>RPMES</b>	
Tom Allan (ASW-472)	Regional Program Manager for Environment & Safety	817-222-4729
Tony Becker (AEA-462)	Regional Program Manager for Environment & Safety	718-712-6343
Jim Harmon (AGL-473)	Regional Program Manager for Environment & Safety	847-294-8473
Marla Noak (AMP-100)	Regional Program Manager for Environment & Safety	405-954-5436
Howard Kimpton (ACT-434)	Regional Program Manager for Environment & Safety	609-485-5998
Alan Stensland (ASO-471)	Regional Program Manager for Environment & Safety	404- 305-6570
(AWP-474.3)	Regional Program Manager for Environment & Safety	310-725-7469
Cathy Benediktsson (AAL-471)	Regional Program Manager for Environment & Safety	907-271-5373
Jim Kitson (ACE-473)	Technical Support Supervisor for Environment & Safety	816-426-3820
Dave Powers (ANM)	Regional Program Manager for Environment & Safety	425-227-1552
Daniel Kiley (ANE)	Regional Program Manager for Environment & Safety	781-238-7816

## **4.2.5 FAA Logistics Center**

### **4.2.5.1 Reclaimed Items**

AML-400 will determine the range and depth of any items that may be reclaimed. Reclamation from equipment stored at the Lucent Phoenix, AZ facility will be coordinated through AOP-500.

### **4.2.5.2 Shipment of Reclaimed Items**

AML-340 will provide instructions regarding the proper transportation, packaging and sources for packaging materials for equipment that is to be recovered, if any, by the FAALC. The FAALC will be responsible for transportation costs associated with shipping equipment from the Lucent facility to the FAALC.

## **4.2.6 Communications and Navigation Division, ARN-200**

### **4.2.6.1 Implementation and Monitoring**

ARN-200 will coordinate with the VSRPT, AND-320, in reviewing and recommending concurrence/non-concurrence with requests for deviation from this plan. All ICSS users and the FAALC will be advised by ARN-200 of any approved program changes or operational requirements which will impact future support requirements ( e.g. continued operation or reuse of facilities, transfers to military or foreign users, hazmat disposal, etc).

### **4.2.6.2 Changes to Maintenance Data Recording Systems**

ARN-200 will coordinate changes to maintenance data recording systems to reflect disposal.

### **4.2.6.3 Historical Preservation and Special Projects**

ARN-200 will coordinate historical preservation of equipment, as required.

### **4.2.6.4 Cessation of Logistics Support**

ARN-200 will coordinate with AML-640 and AOS-100 to phase out and discontinue logistics support, including supply and depot repair, for the Litton and Denro ICSS equipment.

### **4.2.6.5 Removal from Baseline**

Representing the Voice Switching and Recording Product Team; ARN-200 will initiate a NAS Change Proposal (NCP) to eliminate the obsolete equipment from the NAS baseline.

## **5.0 Hazardous Materials Disposal**

Under the provisions of this plan no hazardous material will require processing by FAA field facilities. Equipment which is to be disposed of under this plan, will be shipped as whole systems to the Lucent

facility in Phoenix, AZ and, as such, will not constitute hazardous materials. Lucent will provide certificates of destruction for hazardous materials, if any, removed from equipment dismantled at their Phoenix facility. Batteries, which may constitute hazardous materials, will also be transported by Lucent to an appropriate site for disposal. Batteries will be shipped in accordance with DOT regulations contained in 49 CFR.

## **5.1 Monitoring**

ARN-200 will coordinate with AOP-500 and ANS-500 to monitor early removals of ICSS equipment under this plan to determine if any hazardous materials are identified during disassembly. If such materials are identified, this plan will be revised to include specific instructions for field facilities for disposal of hazardous materials in the absence of the Lucent contract.

## **6.0 Funding**

### **6.1 Vintage Switches**

Funding for removal of the existing voice switches will depend upon the switch configuration at each site. Vintage switches including the AT&T / WECO switches will be funded by AOP-500 under the vintage switch contract. Under this contract Lucent Technologies will remove the old equipment (after disconnection by FAA personnel, and transport it to a central location for disposal.

### **6.2 ICSS and Other Switches**

The AOP-500 contract with Lucent is also available for removal of other voice switches but is subject to funding availability over the life of the ETVS / RDVS IIA installation program. As of this date, funding is available from AOP-500 through FY-99 and will be sought for out-years.

### **6.3 Disposal Without Lucent Contract**

In the absence of the Lucent or successor contracts, removal and disposal must be accounted for in regional work plans and funding provided for removal of the equipment. If DRMOs are to be used then the regional personnel may arrange for transportation of the equipment with the appropriate DRMO point of contact using DOD funded transportation.

#### **6.3.1 Initiation of Property Turn-in**

In order to initiate the property turn-in procedures, an up-front Miscellaneous Obligation Document (MOD) is needed. This may be accomplished by a memorandum from the Regional division wishing to utilize the service to their servicing accounting office notifying them of the division's projected usage. The MOD must contain a dollar amount and appropriate funding source.

## **7.0 Schedule**

The schedule for voice switch replacement is subject to change and is maintained by the VSRPT, AND-320. Removal of obsolete equipment is expected to follow ORD at each site not later than 60 days. An updated copy may be obtained by contacting Mr. Ed Hand, AND-320, at (202) 493-4792.

It is estimated that waste material removal should take less than 5 business days.

## **8.0 Historical Preservation**

In keeping with the FAA's policy regarding the preservation of Air Traffic Control artifacts, the Smithsonian Institution will be given an opportunity to obtain excess personal property. This policy is outlined in FAA Order 1200.8C. Table 12 identifies points of contact for the preservation.

Table (2)

Historical Preservation Organizations

<b>Organization</b>	<b>Point of Contact</b>	<b>Phone Number</b>
Smithsonian Air & Space Museum	Paul Ceruzzi	202-357-2828
FAA Public Affairs	Ned Preston	202-267-3478
FAA Public Affairs (Oklahoma City)	Bob Hoppers	405-954-5332
Air Traffic Control Association	Andrew Pitas	703-522-5717 (Office) 703-777-4838 (Home)
Cradle of Aviation Museum	Josh Stoff	516-572-0411

## **9.0 Precious Metals Recovery Issues**

Recovery of precious metals will not be a consideration when the Lucent contract is used for disposal.

### **9.1 Recovery Without Lucent Contract**

In the absence of the Lucent contract, site and regional personnel are encouraged to affect recovery under the existing Memorandum of Agreement between DOD and DOT referenced in Section 1.5 above. The DRMS web site referenced in section 2.4 above will provide additional and updated information.

## **10.0 Real Property Issues**

None.

## **11.0 Environmental Issues**

None other than those identified in Section 5.

## **12.0 Legal Issues**

None.

## **13.0 Safety Issues**

The lead acid batteries used in the ICSS system contain sulfuric acid and lead. The batteries must be handled to avoid contact with contents.

## **14.0 Labor Relations Issues**

There are no labor relations issues related to the disposal of existing voice switches. Both the ETVS and RDVS IIA programs have been briefed to the FAA's labor unions at the national level in accordance with their respective collective bargaining agreements. Included in these briefs was a description of the equipment that was to be removed.

## **15.0 PHS&T Issues**

None.

## **16.0 Political/International Issues**

None.

## Appendix (1) Disposal Issues

Item No	Definition	Resolution	Status
1	Does the leapfrog program apply and, if so, have all associated requirements been addressed?	Leapfrog generally does not apply to this program. Local exceptions are possible.	Closed
2	Have cannibalization issues been addressed?	Yes. See section 2.5.1.	Closed
3	Is continuing support required for other agencies or contractor maintenance?	No.	Closed
4	Have site spares been properly addressed?	Site dependent. See section 2.5.1.	
5	Have requirements, that are needed prior to disposal activities beginning, been identified?	Yes. This plan provides necessary info.	Closed
6	Has the method of disposal been identified?	Site / regional option	
7	Have requirements for a Technical Support Service Contractor or other contractors been identified?	Regions may elect to use TSSC contractors for equipment removal.	Closed
8	Is the equipment covered under FAA Special Disposal Authority?	Special disposal authority does not apply.	Closed
9	Are any hazardous materials known or suspected in the property being disposed of?	None known or suspected but disposal will be monitored.	
10	Are there any special contractual issues?	None.	
11	Are any precious metals known or suspected and has their value been estimated?	An undetermined amount of precious metals may be present in ICSS CCAs. Reclamation activities (e.g. DRMO) can provide specific estimates.	Closed
12	Are there any environmental issues?	None.	Closed

<b>Item No</b>	<b>Definition</b>	<b>Resolution</b>	<b>Status</b>
13	Are there any real property (both land and structures) issues?	None.	Closed
14	Will equipment removal require an environmental impact statement or environmental assessment?	No.	Closed
15	Will equipment removal require building refurbishment, demolition, or restoration?	Site dependent. Potential requirements to refurbish floors and remove cabling	
16	Will disposition surface concern from neighboring populous?	No. Equipment is internal to ATC facilities.	Closed
17	Are there any legal issues?	None.	Closed
18	Are there any safety issues?	None.	Closed

<b>Item No.</b>	<b>Definition</b>	<b>Resolution</b>	<b>Status</b>
19	Are there any union issues?	None.	Closed
20	Are there any transportation, storage, or handling issues?	None.	Closed
21	Are there any political/international issues?	None.	Closed
22	Are there any historical considerations?	None.	Closed
23	Who is responsible for paying for costs related to removal of hazardous materials?	AOP-500 contract for equipment. Regions are responsible in the absence of the contract. However, no significant level of hazardous materials has been identified.	
24	Who is responsible for paying for costs related to removal of precious metals?	Reclamation activities receiving excess equipment.	Closed
25	Who is responsible for packaging, handling, storage, and transportation?	Regions or reclamation activities depending on method of disposal.	
26	Who is responsible for funding site restoration?	Regions.	Closed
27	Who is responsible for funding building renovation?	Regions.	Closed
28	Who is responsible for funding resolution of legal problems?	None have been identified.	Closed
29	Have trucks been ordered to transport excess property to DRMO?	Dependent on election to use DRMO	Closed
30	Has the associated DRMO been given a 2 week notice that the FAA intends to transport associated property?	Dependent on election to use DRMO	Closed

31	Has the FAALC been notified that equipment is being transported to the depot for spares support?	Dependent on FAALC requirements and prior approval of shipment by FAALC.	Closed
32	Secure power.	Local F&E	Closed
33	Remove & dispose of hazardous waste.	None identified	Closed
34	Identify and tag cables that will be disposed of.	Local F&E	Closed
35	Cut cables leaving connectors attached.	Local F&E	Closed
36	Unbolt cabinets.	Local F&E	Closed
37	Remove cabinets.	Lucent or local F&E	Closed
38	Remove cables.	Lucent or local F&E	Closed
39	Repair floors.	Local F&E	Closed

## **APPENDIX F. OPERATIONAL SUPPORT TELEPHONE SYSTEM (OSTS)**

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## **CHAPTER 1. INTRODUCTION**

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This appendix was developed to provide guidance for integrated logistics support planning and execution of support requirements for the Operational Support Telephone System (OSTS). The OSTS will replace the Administrative Telephone System (ATS) used with the electro-mechanical switch that is being replaced.

The scope of the OSTS is limited to the projects in Terminal Voice Switch Replacement (TVSR) program. These projects include the Integrated Communications Switching System (ICSS), Small Tower Voice Switch (STVS), Rapid Deployment Voice Switch (RDVS) and Enhanced Terminal Voice Switch (ETVS) procurements.

The OSTS will be provided to the sites that meet the following criteria:

- a. The site must have a voice switch that is being replaced by the TVSR Program, and;
- b. The administrative telephone service at the site will be lost when the existing voice switch equipment is removed.

In addition, "freestanding" telephone systems, i.e., those that are not integrated with the air traffic control switch at a TVSR site, will be considered for replacements if they are unable to provide an interface, e.g., a two wire or "off premises extension" interface, for the TVSR switch.

The exact number of OSTS systems required to support the Federal Aviation Administration (FAA) requirements are to be determined (TBD).

### **1.1 SYSTEM DESCRIPTION**

The OSTS is a commercial-off-the-shelf (COTS) telephone system that provides routine administrative communications service. It interfaces with the operational voice switch to provide supervisory access and serves as a backup for ground-to-ground (G/G) communications. The OSTS has been designed to meet all functional performance requirements throughout a service life of at least 10 years of continuous use.

### **1.2 CONTRACT MILESTONE**

The OSTS contract (7 years), DTFA01-94-C-00026, was awarded to Executone Information Systems, Fairfax, Virginia, on March 14, 1994.

### **1.3 INTERFACE REQUIREMENTS AND CAPABILITIES**

The OSTS has the following interface requirements and functional capabilities:

- a. Accommodates up to 64 stations in addition to trunking requirements;
- b. Multiple access capabilities;
- c. Two wire touch tone capability;
- d. Call hold, intercom calling, and night answer capability;
- e. Caller ID display both internal and (optional) external;
- f. Battery backup and station message detail recording.

## CHAPTER 2. LOGISTICS MANAGEMENT

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### 2.1 MAINTENANCE SUPPORT

The contractor will perform all site and depot-level maintenance, beginning with site acceptance and will continue until the contract ends. AOS-100 will identify the source(s) for follow-on maintenance support before the contract expires (Year 2001). While the contract is in force, Executone will maintain a **24-hour toll-free number (1-800-678-9866)** for the Government personnel to use for reporting/logging all trouble reports.

#### 2.1.1 Warranty Repair

Beginning at site acceptance, and for 12 months thereafter, and without charge to the Government, the contractor will correct all failures to equipment and materials furnished by the contractor under the OSTS contract attributed to defects in workmanship. The warranty covers the following (except as noted).

- a. Scope: The contractor will furnish all parts, materials, labor, supporting equipment and services required to perform **warranty services**, and will bear the cost of all incidental expenses (e.g., travel). The Contractor will understand the term “**warranty**” to mean fault localizing and correction (through repair or replacement of parts) of inherent system faults and failures of all equipment furnished under the OSTS contract (including software, peripheral equipment, and cabling).
- b. Response Time: The contractor will ensure that all failures (except those classified as **emergency maintenance**) are corrected by the end of the next business day during which the original trouble report was filed, i.e., between 8:00 AM to 5:00 PM, Government facility local time, Mondays through Fridays, excluding Federal holidays.
- c. Emergency Maintenance. Emergency maintenance is defined as service that is required during evening, weekend, Federal holiday and those hours not currently covered under the maintenance provisions of section 2.1.1.b, “Response Time”, above. Emergency maintenance service will be performed in accordance with will all provisions of Section C.3.5, Maintenance, of the OSTS contract.

The response time for a “**Major Outage**” (defined by OSTS Contract Mod 0057 as: “When 50% or more of the OSTS system is inoperable”) will be within 3 hours after receipt of an emergency service call. All other Emergency Maintenance requested will be performed by the end of the next day. Should the repair/response take place during regular business hours as described in section 2.1.1.b above, it will not be considered emergency maintenance.

Upon receipt of an emergency service call, the contractor will notify the FAA in order that a Task Order may be initiated. The contractor will invoice the designated Task Order with attached emergency work site Labor Actuals with an additional 15% administrative fee. Parts are not to be invoiced as they are covered under "Maintenance". (Reference OSTS Contract Mod 0046.)

### **2.1.2 Contractor Maintenance Support**

Beginning with the conclusion of the warranty period, the Contractor will provide the following maintenance services for a fixed monthly charge per system as identified in the contract.

- a. **Scope**: Furnish all parts, materials, labor, supporting equipment and services required to perform site and depot-level maintenance, and bear all incidental expenses (e.g., CONUS travel) related to any site maintenance performed. The Contractor will understand the term **"maintenance"** to mean fault localizing and correction (through repair or replacement of parts) of inherent system faults and failures, as well as preventive maintenance (as may be required), of all equipment furnished under this contract (including software, peripheral equipment, and cabling).
- b. **Response Time**: Ensure that all failures (except those classified as **emergency maintenance** in section 2.1.2.d below) are corrected by the end of the next business day during which the original trouble report was filed. Business hours are understood to run between 8:00 AM and 5:00 PM, Government facility local time, Mondays through Fridays, excluding Federal holidays. (See Emergency Maintenance)
- c. **Repair and Return Service**: Offer the following repair and return services for items that can be easily removed and shipped by Government personnel (e.g., station sets, handsets, cords), subject to the following requirements:
  - 1) The contractor will prepay the shipment from the OSTS site and arrange for pickup (e.g., by a commercial parcel delivery service).
  - 2) The contractor will repair or replace the defective component and ship it back to the site within 18 business hours of receipt.
- d. **Emergency Maintenance**. Emergency maintenance is defined as service that is required during evening, weekend, Federal holidays and those hours not currently covered under the maintenance provisions of section 2.1.2.b, "Response Time", above. Emergency maintenance service will be performed in accordance with will all provisions of Section C.3.5, Maintenance, of the OSTS contract.

The response time for a **“Major Outage”** (“When 50% or more of the OSTS system is inoperable”, per contract Mod 0057) will be within 3 hours after receipt of an emergency service call. All other Emergency Maintenance requested will be performed by the end of the next day. If the repair/response take place during regular business hours (section 2.1.2.b above), it will not be considered emergency maintenance.

Upon receipt of an emergency service call, the contractor will notify the FAA in order that a Task Order may be initiated. The contractor will invoice the designated Task Order with attached emergency work site Labor Actuals with an additional 15% administrative fee. Parts are not to be invoiced as they are covered under “Maintenance”. (Reference OSTS Contract Mod 0046.)

### **CHAPTER 3. SUPPORT EQUIPMENT**

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The contractor will provide any support equipment required.

## CHAPTER 4. TRAINING SUPPORT

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The contractor will provide the instructor personnel and the materials required for OSTS training. The training will include the following:

- a. General orientation and user training. Operate the system to place calls, receive calls, and operate all user-calling features.
- b. Attendant training. Operate the attendant position utilizing user calling features and all attendant calling features, to place, answer, and direct calls, and to use its special features.
- c. Administrative support training. Operate all remaining features and capabilities of the system including performing moves and changes, programming call restrictions, collecting call accounting data, responding to alarms, and logging trouble reports.
- d. Scheduling. Conduct training scheduled by the Government during normal business hours.
- e. Training Materials. Provide copies of all written training materials to each individual attending the training.

## **CHAPTER 5. PACKAGING, HANDLING, STORAGE, AND TRANSPORTATION**

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The contractor will deliver, unpack, and assemble the OSTS equipment; and prepare the wiring for the installation. This includes moving the distribution station equipment to its intended location within the facility, and setting up and connecting the optional OSTS equipment features ordered.

The contractor will remove from the facility and dispose of all packing material and debris associated with the OSTS installation, warranty, and maintenance activities.

## **CHAPTER 6. DOCUMENTATION**

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### **6.1 USER'S GUIDE**

The contractor will deliver a User's Guide to each site. The Guide provides detailed information for using the multi-button telephone, describes how to use the OSTS system to initiate and receive calls, and provides instructions on how to activate call features.

### **6.2 PROGRAMMING AND MAINTENANCE GUIDE**

The contractor will also deliver a Programming and Maintenance Guide to each site. The Guide provides detailed information for programming the OSTS administrative terminal.

### **6.3 REPRODUCTION**

The OSTS contract allows the Government to reproduce (e.g., photocopy) OSTS documentation freely and without restriction. OSTS sites requiring additional copies of the Guides should reproduce them locally.

## **CHAPTER 7. DISPLACED EQUIPMENT AND SUPPORTING SPARES**

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Leased equipment and spares displaced by the OSTs equipment will be removed and disposed of in accordance with previous agreements between the Government and the leaseholder.

The Government is responsible for removing all existing telephone equipment. Government owned equipment and spares displaced by the OSTs will be removed and disposed of in accordance with FAA Order 4800.2C and AAF-1 Memorandum, "Disposition Decisions for Replaced Equipments", dated October 1, 1992.

## **APPENDIX G. VOICE SWITCH BYPASS (VSBP)**

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## **CHAPTER 1. INTRODUCTION**

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This appendix was developed to provide guidance for integrated logistics support planning and execution of support requirements for the Voice Switch Bypass (VSBP).

The scope of the VSBP project is limited to the projects in the Terminal Voice Switch Replacement (TVSR) program. The TVSR projects include the Integrated Communications Switching System (ICSS), Small Tower Voice Switch (STVS), Rapid Deployment Voice Switch (RDVS) and Enhanced Terminal Voice Switch (ETVS) systems.

### **1.1 SYSTEM DESCRIPTION**

The VSBP provides air traffic control (ATC) facilities with EMERGENCY access to and control over Government-furnished very high frequency (VHF) and ultra high frequency (UHF) radio receiver/transmitters and associated signaling systems. The air-to-ground (A/G) connectivity provided via the VSBP enables air traffic controllers to establish and maintain communications with aircraft.

The VSBP will be installed in FAA terminal radar approach control (TRACON) and air traffic control tower (ATCT) facilities that operate under instrument flight rules (IFRs). Within these facilities, designated air traffic control (ATC) positions equipped with a VSBP jackbox will be provided an emergency A/G communications capability in the event of an ICSS, STVS, RDVS, and or ETVS switch failure.

## 1.2 PROJECT MILESTONES

VSBP logistics milestones are shown in Table 1.5-1.

TABLE 1.5-1 MILESTONES

Event	Date
Statement of Work (SOW) Preparation	January-April 1995
PASS Union Briefed	July 20, 1995
Contract DTFA01-95-Y-01014 , Awarded to DME Corporation, Ft. Lauderdale, FL	August 23, 1995
Logistics & Training Guidance Conferences	September 1995
OT&E/Shakedown Test	February-April 1996
FCA/PCA	March 1996
First Production Unit Delivered to Chicago (O'Hare)	June 1996
DRR EXCOM	June 20, 1996

## **CHAPTER 2. LOGISTICS MANAGEMENT**

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The FAA Logistics Center (FAALC) is responsible for managing the supply and maintenance support program for the VSBP. Warranty claims, requisition issues and questions should be directed to the FAALC Customer Care Center at Toll Free at 1-888-322-9824, or (405) 954-3793. If the Customer Care Center cannot answer your questions they can ensure correct routing to an individual at the FAALC who can assist you.

Sites can also order replacement LRUs via the FAALC Logistics and Inventory System (LIS).

## **CHAPTER 3. MAINTENANCE PLANNING**

---

Since the VSBP will be used with and operate in conjunction with the ICSS, STVS, RDVS, and ETVS systems, ARN-200 has determined that the established and approved support concepts in the appropriate voice switching system ILSP (i.e., ICSS, STVS, RDVS, ETVS) will apply to the VSBP.

### **3.1 VSBP MAINTENANCE CONCEPT**

The VSBP will be supported by two levels of maintenance: site/field and depot maintenance.

- a. Site/field maintenance consists of the AF technician isolating the failure to the line replaceable unit (LRU) and replacing the failed item with a serviceable LRU.
- b. Depot maintenance consists of FAALC repair (through the use of a contractor repair service or in-house resources) of faulty LRUs.

### **3.2 SECOND LEVEL ENGINEERING SUPPORT**

When required, AOS-510 will obtain contractor technical assistance via the technical assistance options available in the VSBP contract.

### **3.3 WARRANTY PROGRAM**

The Tellabs components used in the VSBP are covered by a 5 year Tellabs warranty. The VSBP components manufactured by DME, e.g., jackbox, backplane, cables are covered by a 3 year DME warranty. Warranty claims/questions should be directed to the Item Manager. (See Chapter 2, above.)

## **CHAPTER 4. SUPPLY SUPPORT**

---

FAALC will be responsible for providing supply support for the VSBP life cycle. Since the VSBP consist of a small number of LRUs, FAALC conducted an in-house mini-provisioning conference. Based on the results of the conference, FAALC cataloged the spares and AND-320/ASU-330 ordered the spares. FAALC has received the depot spares.

Sites can order replacement LRUs for the VSBP via the FAALC Logistics and Inventory System (LIS).

Assistance can be obtained from the FAALC Customer Care Center Toll Free at 1-888-322-9824, or (405) 954-3793. If the Customer Care Center cannot answer your questions they can ensure correct routing to an individual at the FAALC who can assist you.

## **CHAPTER 5. SUPPORT EQUIPMENT**

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No special tools and test equipment are required to support the VSBP. Common tools and test equipment used to repair voice switching systems will be used to support the VSBP.

## **CHAPTER 6. TRAINING**

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### **6.1 GENERAL INFORMATION**

A training video tape for VSBP training will be delivered with the VSBP equipment. Air Traffic (AT) and Airway Facilities (AF) personnel will be trained using the training video. The video is divided into two parts. Part I describes the overall VSBP operation and demonstrates all of the VSBP functions. Part II provides information on isolating VSBP faults to the LRU level and demonstrates the corrective actions or alignments required to restore the system to service.

### **6.2 TRAINING OUTCOMES**

After viewing the video and using the procedures described in the video and the Installation, Operation, and Maintenance (IOM) manual, the student will have knowledge of and be able to:

- a. Operate the VSBP switch equipment;
- b. Perform fault isolation, corrective maintenance and alignment(s) to restore the equipment performance to the parameters specified in the contract.

### **6.3 ATTRITION TRAINING**

The sites are responsible for the initial and attrition VSBP training.

## **CHAPTER 7. PACKAGING, HANDLING, STORAGE, AND TRANSPORTATION**

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DME will comply with all the packaging, handling, storage, and transportation (PHS&T) requirements specified in ASTM-D-3951, Standard Practices for Commercial Packaging; MIL-STD 2073-1, DOD Material Procedures for Development and Application of Packaging Requirements; and MIL-STD 129L, Marking for Shipment and Storage.

Sites and the contractor will use the established FAA guidelines for shipping and transporting LRUs by the most economical means available.

## **CHAPTER 8. TECHNICAL DATA**

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### **8.1 INSTALLATION, OPERATION, AND MAINTENANCE (IOM) MANUAL**

DME will deliver an IOM manual and an FAA Air Traffic Operations Concept document with each VSBP. The manual contains instructions and procedures for the installation, operation, and maintenance of the VSBP hardware and includes data and commercial drawings on all non-developmental items (NDI) and custom built items. The level of detail contained in the manual enables AT operators/supervisors to operate the VSBP and AF technicians to identify, isolate and correct hardware failures to the LRU level.

AOS-510 is the Government proponent for the IOM manual.

### **8.2 LIFE CYCLE PARTS AND SERVICE DATA**

DME will deliver to the Government a complete set of technical data and documentation with updates as they are generated, including proprietary information on custom built items, which will enable the Government to assume full maintenance and technical support of the VSBP system equipment.

### **8.3 COPYRIGHT**

The contractor delivers all VSBP data without restrictive legend(s) and the Government has the right to reproduce any of the data.

## **CHAPTER 9. DISPOSITION OF DISPLACED EQUIPMENT AND SUPPORTING SPARES**

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Since the VSBP is not replacing any equipment, a disposal plan is not required.

## **APPENDIX H. RELIABILITY ASSURANCE PROCEDURES**

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## **1.0 ETVS Reliability Assurance (RA) Procedures for Replacing a Failed LRU (During Period)**

### **1.1 SITE will:**

1.1.1 Fault isolate to the LRU level and replace the failed LRU with a site spare. Save packing material and reusable shipping container.

1.1.2 Schedule the package for UPS pick-up:

1.1.2.1 Calling Denro, UPS Pick-up at 1-301-869-1628;

1.1.2.2 Identifying that you are an ETVS Site, providing your Site Name, Denro assigned Site Number (if known, i.e., WJHTC-725, SBA-757, COS-865, etc), the address (building and room number) for your facility's UPS pickup point, and request a UPS GROUND pick-up be scheduled.

1.1.2.3 Denro will issue a RMA Number that is to be placed on both the package and the Denro Customer Failure Report, Form 419-CUS-FM-005 (see attachment A)

1.1.3 Complete a Denro Customer Failure Report, Form 419-CUS-FM-005 and include the RMA# (step 1.1.2.3 above) provided by Denro.

1.1.4 Package the failed LRU in an anti-static bag and place the LRU and a copy of the completed Denro Customer Failure Report in the Denro provided reusable shipping container.

1.1.5 Affix the Denro provided preaddressed shipping label to the container. In the event a preaddressed shipping label is not available address the container to:

Denro  
Depot Receiving  
15883 Gaither Drive  
Gaithersburg, MD 20877  
RMA#

1.1.6 Place the packaged LRU at your facility's UPS pickup point that was identified (step 1.1.2.2 above). The UPS will only pickup at this location. If UPS does not pick up the LRU in two (2) business days, call the Denro at (301) 869-1628 for assistance.

1.1.7 After the failed LRU is picked up, the site must request a serviceable replacement LRU from the FAA Logistics Center via the Logistics and

Inventory System (LIS). On the LIS Form enter the UPS Shipping/Tracking Number from the UPS receipt of pickup and the Denro RMA# in the Mark 4 or Remark block. If LIS is not available, fax the nomenclature, part number, NSN, the UPS Shipping/Tracking Number from the UPS receipt of pickup and the Denro RMA# on plain white paper to:

FAA Logistics Center  
ATTN: AML-6000 (Carrie Cline, IM-59)  
Facsimile: (405) 954-4942  
Telephone: (405) 954-5589

1.1.8 DO NOT fax request to Denro to avoid duplication.

- 1.2 **FAALC IM**. Upon receipt of the LIS request from the site, the FAALC IM will notify Denro by facsimile message at (301) 840-1578 that a failed LRU is being returned for repair. The facsimile message will include the site's identification number (if known) and shipping address, and the LRU's nomenclature, part number, and national stock number (if assigned). The IM will FAX the UPS tracking number when it is received from the site to Denro.

**NOTE:** DENRO WILL NOT SHIP A REPLACEMENT LRU UNTIL IT RECEIVES THE FAX NOTIFICATION FROM THE FAALC IM THAT CONFIRMS UPS HAS PICKED UP VIA THE UPS TRACKING NUMBER.

- 1.3 **DENRO**. Upon receipt of the facsimile notification from the FAALC IM and confirmation that UPS has picked up the failed LRU (i.e., UPS has entered the pickup into their computer database), Denro will ship the replacement LRU directly to the site to arrive within 10 business days.

1.3.1 Shipment shall be made in a Denro provided reusable-shipping container. Denro shall include a preaddressed shipping label in the container.

1.3.2 Denro shall be responsible for the transportation cost for shipping the failed LRU from site and for shipping the replacement LRU from Denro facility to the site.

- 1.4 **SITE**. Upon receipt of the replacement LRU, the Site will return the serviceable LRU to site stock, as appropriate.
- 1.5 Questions concerning RA claims/procedures should be referred to the FAALC Customer Care Center at 1-888-322-9824 or (405) 954-3793. If the Customer Care Center cannot answer your questions, they can ensure correct routing to an individual at the FAALC who can assist you.

## **2.0 EXCHANGE AND REPAIR (E&R) PROCEDURES FOR REPLACING A FAILED ITEM/LRU(AFTER RA EXPIRATION)**

- 2.1 SITE. After a site's reliability assurance coverage expires (one year after site acceptance), the site will request a serviceable replacement LRU via the FAALC LIS.
- 2.2 FAALC. After receiving a LIS request, FAALC will prepare FAA Form 4250-5, Equipment Return Document, and ship a serviceable LRU and Form 4250-5 to the requesting site.
- 2.3 SITE. After receipt of the serviceable item and the Form 4250-5, the site will return the failed LRU to FAALC, within 15 calendar days. The site will be responsible for the shipping costs for returning the failed LRU to FAALC. FAALC purges their delinquent due-in facility (DIF) file every 30 days. If the site has not returned the failed LRU before the DIF is purged, the FAALC will bill the site the full price for the item.
- 2.4 Copies of Form 4250-5 will be distributed as follows:
  - 2.4.1 Copies 1, 2, and 3 (these copies are used to process the billing credit for the returned item). Place inside shipping container with the failed item and ship to the FAALC.
  - 2.4.2 Shipping label (unnumbered copy). Attached to the outside of the container.
  - 2.4.3 Copies 4, 5, and 6. Retain for ordering office/site use.
- 2.5 If form 4250-5 is not available (e.g., due to an accelerated return of the unserviceable or loss of the document), the site should contact the FAALC Customer Care Center Priority Desk at 1-888-322-9824 for a replacement document.
- 2.6 Questions concerning Exchange and Repair (E&R) claims/procedures should be referred to the FAALC Customer Care Center at 1-888-322-9824. If the Customer Care Center cannot answer your questions, they can ensure correct routing to an individual at the FAALC who can assist you.

## DENRO CUSTOMER FAILURE REPORT

### CUSTOMER INFORMATION

RMA NUMBER

SITE NUMBER

ITEM NAME

POINT OF CONTACT

RETURN ADDRESS

E-MAIL

PHONE / FAX

DATE OF FAILURE

PART NUMBER

REV

SERIAL NUMBER

### LOCATION OF FAILED LRU

RACK NUMBER

CARD CAGE

SLOT NUMBER

POSITION NUMBER

POSITION TYPE

POSITION LOCATION

**SPECIFIC PROBLEM WITH THE LRU. INCLUDE ALL ACTIVITY PRECEDING FAILURE**

## **APPENDIX I MAINTENANCE REPAIR SUPPORT FOR HEADSETS/PERIPHERALS**

Attached is the memo that provides the instruction for maintenance repair support for headsets and peripheral on the voice switching system. Please contact the **FAALC Customer Care Center for assistance at 1-888-9824 or (405) 954-3793** in lieu of Ms. Robin Starks.



US Department  
of Transportation

**Federal Aviation  
Administration**

# Memorandum

Subject: ACTION: Maintenance Repair Support for  
Headsets/Peripherals on Voice Switching Systems

Date:

From: Manager, Communications and Navigation Division, ARN-  
200

Reply to  
Attn. of:

To: Distribution

Below are updated procedures regarding maintenance, repair, and support of the voice switch headsets and peripheral equipment. These procedures apply only to the below referenced voice switching systems that have been procured and/or managed by the Voice Switching and Recording Product Team, AND-320. This memorandum supersedes all previous direction provided regarding this issue.

If the type and manufacturer of the voice switch requiring support is not listed below, refer to your regional resources for instructions regarding support procedures. In all likelihood, a regional or local support contract is in effect.

Directions: Please identify the type and manufacturer of the voice switch at the facility requiring field support for headsets and/or peripheral equipment. Then reference the depicted support source in the adjacent column.

Type and Manufacturer of Voice Switch	Support Source
Litton Type II ICSS	Litton-Amecom
Litton Type III ICSS	Litton-Amecom
Litton RDVS I or II	FAA Logistics Center
Litton RDVS IIA	FAA Logistics Center
Denro Type I ICSS	Denro
Denro Type III ICSS	FAA Logistics Center
Denro Model 466 ICSS (purchased GSA)	Denro
Denro Model 400 ICSS (purchased GSA)	FAA Logistics Center
Denro RDVS I	FAA Logistics Center
Denro RDVS II	FAA Logistics Center
Denro STVS	Denro (for 1 year from installation)
Denro STVS	FAA Logistics Center (after 1 year from installation)
Denro ETVS	FAA Logistics Center

Contact telephone numbers:

- Litton-Amecom 1-800-847-7790
- Denro 1-800-952-2502
- FAA Logistics Center 1-405-954-7649

If you have any questions, please contact Mr. George Clark, ARN-200.3 at 202-493-4789.

//s//6/29/98

Janis E. Hooten

Distribution:

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ACE-400/500  
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AMA-400/500  
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ASO-400/500  
ASW-400/500  
ATO-100/400  
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